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ON

MALIGNANT CHOLERA;

ITS ORIGIN, PATHOLOGY, TREATMENT, AND MODE OF PREVENTION,

WITH THE OCCUPATIONS OF 5,568 MALES OVER 20 YEARS OF AGE
THAT DIED IN LONDON IN 1849, 1853, 1854, AND 1866:

WITH AN APPENDIX

On Cattle Plague as compared with Cholera and other human maladies; its history, pathology, treatment, and future prevention. A Letter on Homœopathy; its false inferences and hollow assumptions. With an Essay on the present state of the Medical and Veterinary Professions in this country.

BY

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Late Editor of the London "Medical Examiner;" Author of "A Rejected Candidate at the Royal College of Physicians, and an Examination of the Examiners," 1849; *Author of a Work on the Structure and Use of the Spleen,* 1854, *with the weight of the Viscera and length of the Alimentary Canal in more than* 500 *species of animals; Medallist at the Medical Society of London,* 1843; *Author of the Jacksonian Prize Essay on the Structure and Diseases of the Blood-Vessels,* 1845; *the Jacksonian Prize Essay on Intestinal Obstructions,* 1852; *the Astley Cooper Prize Essay* (£300) *on the Structure and Use of the Thyroid Gland,* 1859; *the Astley Cooper Prize Essay* (£300) *on the Structure and Use of the Pancreas,* 1862; *the Bath and West of England Prize Essay on Parasitic Diseases in the Lungs of Lambs,* 1864, *&c. &c.*

"If an artery is bleeding, we endeavour to arrest the hemorrhage; and I think it is equally or more important to stop the flow of serum in the early stage of cholera.'*—*From the Author's Essay on Cholera,* 1849.

LONDON:
ROBERT HARDWICKE, 192, PICCADILLY.
1866.

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PREFACE.

I AM induced to reprint this essay on "Asiatic Cholera," read at the Medical Society of London, October 28, 1849, and published in the *London Medical Examiner*, and one Faculty Journal (which I then edited), for several reasons. Firstly, because I believe it contains statistical information of much value that may be turned to useful account at the present time; and because it was the first attempt made in this, or in any other country, to show the influence of occupation in the production of this fearful disease. The time allotted to the reading of a paper at a Medical Society necessarily compelled me to condense the matter to a great extent, and I shall now endeavour, by adding my subsequent information and experience, to make the essay more practical and useful.

Another motive which especially induces me to publish this treatise is the endeavour to controvert what I believe to be a dangerous doctrine, extensively circulated at the present time by the public press, viz., the so-called eliminative or aperient treatment of Cholera. Dr. G. Johnson, the recent promulgator of this theory, says, in his "Notes on Cholera," a book which has been extensively circulated and noticed by the public press:—*"The main object of this publication is to sweep away an erroneous theory with regard to the nature of Cholera, the theory in question being one which of necessity carries with it a mischievous mode of practice, and an entirely wrong estimate of the influence of treatment in the disease."

It behoves one to speak with great diffidence respecting the nature and treatment of a disease about which so little is known; but I think

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* Since this work appeared, Dr. Johnson has published a pamphlet upon the same subject, the greater part of which is composed of a laudatory review of his work in the *Saturday Review*, June 2, by Dr. Watson, the President of the College of Physicians, "the most lucid account of the nature and treatment of Cholera that has yet appeared," according to Dr. Johnson's opinion, as stated in the Preface. The sanction of such a reputed authority as Dr. Watson's induces me to enter more fully into this question than I otherwise should have done.

I shall be able to show that the *mischievous mode of practice* applies with greater force to Dr. Johnson's treatment than to that which he so sweepingly condemns. If the suggestion I made in 1849 (p. 9), as to the comparative treatment, had been adopted by the Government, we might speak with more certainty and precision upon many points that are now involved in dobut and obscurity.

It is not pretended that castor-oil in the latter stage of Cholera, or any medicine of a mild form, can do much good or harm; but I believe that castor-oil or any aperient in the primary stage would often produce injurious results, and hence the importance of guarding the public against the so-called eliminative or aperient treatment in the early stages of the disease. The poison, I believe, may often remain inert in the system until some disturbing force, such as fear, bad diet, and water, or aperient medicine, acts as an exciting cause in deranging the constituent parts of the blood.

There is one erroneous inference that might perhaps be drawn from the perusal of the re-published essay which I am anxious to prevent, viz., that I attach too little importance to sanitary measures. I believe now, as I did in 1849, that no amount of dirt, filth, or overcrowding will *alone* produce Cholera; all these causes will predispose to the disease and increase the mortality, and therefore all sanitary regulations and house to house visitations, with a proper supply of medicine in all affected districts, should be strictly enforced; but care must be taken not to increase the mischief, as in 1832, by over officious meddling; by the removal of nuisances that may become more deadly the more they are disturbed. The time has passed for these disturbances, and better will it be to use disinfectants and shut out the deleterious gases than aggravate the evil by their greater dissemination.

To some, the addition to this essay of a treatise on Cattle Plague, even in the shape of an appendix, may appear out of place; but I have fully explained my reasons for this unusual combination, and I hope that a profitable comparison may be made between this human scourge and the bovine pestilence. As I have said on a former occasion, most of our discoveries in physiology have been derived from experiments on the lower animals; and I see no reason why brute pathology may not be turned to equally good account in the elucidation of human maladies.

42, Beaufort St., Chelsea, and 21, Parliament St.,
September, 1866.

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MALIGNANT CHOLERA.

[Paper read at the Medical Society of London, October 28th, 1849, by the Author.*]

There is no disease about which so much paper and ink have been so uselessly and, I fear, injuriously consumed, as the Malignant o- Asiatic Cholera; and although the present epidemic has afforded most medical practitioners in large towns abundant opportunities of investigating the nature and origin of the malady, as well as its treatment, I doubt whether much progress has been made towards the elucidation of these important subjects. I am old enough to remember the first case of this mysterious scourge, which occurred in Sunderland in 1831. I heard the various and contradictory opinions advanced at that time respecting the disease, and I was present at this society when Dr. Tytler for several evenings endeavoured to persuade the members that damaged rice was the *fons et origo* of the mischief. He denominated the disease Cholera Oryzea, and most ingeniously traced the connection between the progress of the malady and the circulation of damaged rice; several of the members were deluded by his arguments, and readily became converts to his views. Dr. Tytler, whose honesty of purpose I will not for a moment question, is now numbered with the dead; many of his hearers have also slept their last sleep. Amongst those who took a prominent part in the discussion I may mention Dr. James Johnson, whose sensible and practical remarks upon the nature and treatment of this and other diseases many in common with myself have often listened to with great interest and instruction. I well remember, after numerous plans of treatment had been recommended, that Dr. Walshman (then an octogenarian), following the example of Sydenham, expressed his opinion that diluents, such as weak chicken broth given in large quantities, would be the best means of treating the disease. Young and inexperienced, and, like most juvenile practitioners, placing too much confidence in the power of medicine, I laughed at the old physician's remedy, and classed him with the cooks and nurses, whose office it is to prepare such-like slops. Profiting, however, by subsequent experience, and knowing the thousand and one modes of treatment that have been adopted and lauded by their respective promulgators, I am induced to ask, whether the chicken-broth system of Dr. Walshman would not in many instances have been more efficacious than the host of medicines to which I have just alluded, and I am reluctantly compelled to answer this question in the affirmative. It is true that patients have recovered from a state of collapse under almost every plan adopted, but they have, I believe, often recovered in spite of the doctor and his drugs.

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* Reprinted from the *London Medical Examiner* and one Faculty Journal.

Let it not be supposed from these remarks that I have any doubt about the efficacy of medical treatment in this disease; I believe that there is scarcely a complaint to which the human body is subjected more amenable to treatment in the early stage, if the remedies are judiciously and opportunely applied. In almost every fatal case that has come under my notice, the preliminary diarrhœa or serous hemorrhage has continued for a longer or shorter period, and no attempt has been made to arrest it. The patient often appears to himself and friends in no peril; in a short time, however, the cold hand of death is upon him, and the muddy current of the blood ceases to flow. Medical aid is generally in this condition unavailing, and a disease, which a few hours before was under the control of the physician, now defies his art. The above is not an overdrawn picture; it was one of daily, nay, almost of hourly occurrence, and the fault rested more frequently with the patient than with his medical attendant.

In the present communication my object is to direct the attention of the members of the society to that which is practical, and I shall avoid, as much as the nature of the subject will admit of, all speculative considerations. I might occupy many pages in discussing the question as to whether the Malignant Cholera prevailed in this country before 1831, and whether the disease was known in India before 1817. I shall merely, however, express my opinion that the disease described by Hippocrates, Celsus, Sauvages, Sydenham, and other writers, is not the Malignant Cholera of the present time; and when we examine the history of the black death, sweating sickness, and other epidemics of the 14th, 15th, and 16th centuries, and observe their commencement and decline, the probability I think is greatly increased that Cholera is a new disease, and that, like the scourges of the middle ages, it will desolate the earth for a time, and then give place to some fresh pestilence.

I shall not dwell long on the various opinions which have been advanced respecting the cause of the disease. I believe that it is still involved in as much obscurity as ever; for whether we look to earth, sky, air, or water, insurmountable difficulties offer themselves. All we at present know about the matter is, that this inscrutable agent has certain powerful assistants in its train; such as a moist atmosphere ; animal and vegetable malaria ; depression and anxiety of mind ; certain articles of diet and drink, and probably some trades and occupations. But as a proof that these agents *alone* will not produce the disease, there are millions living in malarious districts where Cholera has not been seen ; thousands of the rural population are drinking water from ponds and wells near their cottages, which is swarming with animalculæ, and contaminated with decayed vegetable matter ; numbers are in the midst of filth and wretchedness, and yet the pestilence comes not to their habitations. This scourge has decimated the inhabitants of one side of a river, whilst those on the opposite bank have remained unscathed. This hidden poison defies heat and cold, for its victims have been almost as numerous in the regions of Northern Europe as under the burning sun of India ; and what is especially remarkable in the present epidemic is the fact, that although man has been blighted, the lower order of animals has escaped the stroke, and the vegetable kingdom (especially the cereal species) has been more than usually productive.

But I must quit this part of my subject, and proceed to the chief objects of my paper, which I shall divide into three parts :—1. The influence of occupation. 2. The contagious nature of the disease ; and 3. The most approved mode of treatment. In investigating the first and second questions, I shall take for my text the reports of the Registrar-General, which I have carefully analysed. And here I cannot forbear yielding a just tribute of praise to Mr. Farr, for the care bestowed in the compilation of these reports, which I think are destined at a future period to elucidate some of the difficult points connected with the etiology of disease.

I commence my analysis with the week ending June 30th, as the trades and occupations of those dying of Cholera are then more particularly given. Diarrhœa, too, had its victims ; but as these cases are not individually reported for the first seven weeks, I shall merely give the number of cases occurring during that time, viz. 872. It is necessary also to state, at the onset of the inquiry, that I consider that the greater number of deaths from Diarrhœa were produced by the choleraic poison, and that I believe serous purging is essentially one of the stages of Cholera.

During the 17 weeks through which I have carried my analysis, and ending October 20th, the deaths from both diseases amount to 16,172 : Cholera, 13,410 ; Diarrhœa (so called), 2,762; making a weekly average of rather more than 951. Nearly three-fourths of the victims to Diarrhœa die under 15 years of age, viz. 1,927 ; whilst from the age of 15 to 60 only 365 have died ; of those 60 years old and upwards, 470. Not so with Cholera ; in this disease the greatest number of deaths, or considerably above the half, have occurred from 15 to 60 years of age ; the numbers being under 15, 3,640 ; from 15 to 60, 7,710 ; 60 years and upwards, 2,060. The cases of Diarrhœa before alluded to, numbering 872, in which the sex is not named, reduce the cases analysed to 15,302; of these 7,214 were males, 8,088 females.

To ascertain the influence of occupation in the production of the disease, I have selected from these reports all the males 20 years of age and upwards, amounting to 4,258, and the following is the result of the investigation.* Accountants, clerks, and writers, 103; architects, builders, and surveyors, 13; actor, 1; agents, 10; artists, 6; bookbinders, printers, publishers, and compositors, 93; bakers, 49; butchers, 39; tripe-dressers, 2; bacon-drier, 1; pork-butcher, 1; poulterers, 5; pieman, 1; cat's-meat men, 2; horse-slaughterers, 2; drovers, 6; cattle-dealer, 1; skinners, fellmongers, and leather-dressers, 13; curriers and tanners, 26; bone-collector, 1; bricklayers, plasterers, and masons, 64; brickmakers, 8; beadles, 4; brewers, 6; brokers, 4; stock-brokers, 3; draymen, 2; basket-makers, 5; carpenters, cabinet-makers, coopers, millwrights, coach-makers, and all workers in wood, 338 (of these 119 are carpenters, 60 cabinet-makers, and 5 upholsterers); piano-forte makers, 6; coachmen, carmen, omnibus conductors and drivers, 111; grooms, 7; hostlers, 22; farriers, 11; horse-dealer, 1; horse-keepers, 6; livery-stable man, 1; coalheavers and coal-whippers, 22; meters, dealers, and weighers, 8; cheesemongers, 14; chandlers, 6; corn-chandlers, 4; tallow-chandler, 1; cooks, pastry-cooks, and eating-house keepers, 13; chemists and druggists, 5; ministers of religion, 2 Episcopalians (one of them a lunatic), 1 doctor of divinity, 1 Wesleyan, 1 Unitarian, 1 dissenting; costermongers, 10; green-grocers and fruiterers, 15; cow-keepers, 6; dairymen and milkmen, 9; dyers, 8; drapers and hosiers, 23; general dealers, 16; engineers, 40; furniture brokers and dealers, 3; furriers, 11; farmers, 6; millers, 2; maltster, 1; fishmongers, dealers in fish and fishermen, 22; gentlemen, 132; merchants, 21; retired tradesmen, 34; flusherman of sewers, 1; sewers labourer, 1; rag-sorter, 1; scavengers, 5; dustman, 1 (æt. 81); chimney-sweeps, 7; sweeps, 4; well-sinker, 1; fireman, 1; french-polisher, 6; gas-men, 3; gas-stokers, 2; lamp-lighters, 6; link-man, 1; gardeners, 52; grocers, 17; hatters, 26; hawkers, 32; inn-keepers, licensed victuallers, beer-shop keepers, and barmen, 40; potmen, 5; labourers, 689; lawyers, 14; (law clerks before stated, 14); master of workhouse, 1; medical men, 17; musicians, 12; oilmen, 6; officers, police 23, customs 12, relieving 1, sheriff's 1; pawnbrokers, 5; marine store keepers, 4; postmen, 6; painters, plumbers, and glaziers, 74; pensioners, 72 (old); porters, 111; servants, waiters, and messengers, 54; soap-makers, 2; sailors and men employed on the water, 307; soldiers, including the invalided, 46; salesmen, 8; schoolmasters and teachers, 6; shoemakers, 154; tailors, 78; travellers, commercial, 21; tobacconists, 8; weavers, 96; warehousemen, 9; watchmen, 5; undertakers, 5; vagrants, 2; workers in iron, 102; silver and gold, 25; brass and copper, 30; tin, 9; glass and earthenware, 24; colours, 4; leather (exclusive of shoemakers) 22; hair, 27; wool, 9; tow, 15; paper, 9; bone, 3; miscellaneous occupations, difficult to classify, 103; occupations not stated (the returns in the first papers being imperfectly given), 399. Amongst the last, convicts, prisoners, and paupers are included.

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* The subjoined account of the principal occupations in the metropolis recently published (Feb. 4), by the intelligent writer in the *Morning Chronicle*, on Labour and the Poor, will enable our readers to make their own deductions:—"Domestic servants, 168,701; labourers, 50,279; boot and shoe makers, 28,574; tailors and breeches makers, 23,517; clerks (commercial), 20,417; carpenters and joiners, 18,321; laundry-keepers, 16,220; porters, messengers, and errand boys, 13,103; painters, plumbers, and glaziers, 11,517; bakers, 9,110; army, 8,043; cabinet-makers and upholsterers, 7,973; silk manufacturers, 7,151; schoolmasters, &c., 7,138; butchers, 6,450; bricklayers, 6,743; blacksmiths, 6,716; printers, 6,618; booksellers, &c., 5,499; coachmen, guards, &c., 5,428; weavers (all branches), 5,065." From the shoe makers 3,717 females must be deducted, and of the domestic servants, females will form a large proportion.

I may mention an interesting fact in my own parish. In one of the Ragged Schools (the Juvenile Refuge, Old Pye Street, Westminster) there are about 110 children, boys and girls, whose needful certificate of admission is their utter destitution and unfitness to appear in other schools, many not indulging in the luxury of shoe or stocking. The children are engaged in various ways from nine in the morning until eight at night, and each child has a bath three times a week. 90 of them have two meals a day at the school; for dinner, 1 pint of pea soup, meat soup, or cocoa alternately, and half a pound of bread, excepting Sunday, when those who remain are regaled on treacle instead of soup. Their supper always consists of 4 oz. of bread with water to drink. Of the 90 thus cared for, only one child has died of Cholera, and this was at the first appearance of the disease, when the premonitory Diarrhœa was neglected (five people died in the same house). Under the windows of this school there are three open privies, the stench from which is sometimes scarcely bearable. In the New Pye Street Ragged School, where there are 200 children, not one death has occurred. In Pear Street School there is about the same number, and only one girl died. In the New Tothill Street School, there has not been a single death among 63 children. So that in nearly 600 children living in a close and badly ventilated neighbourhood, miserably clothed and worse fed (they are only fed at the Juvenile Refuge) only 2 died of Cholera.

Before commenting on these reports, I must premise that there are certain facts which it is especially necessary to bear in mind. First. The localities: and the interesting diagram of the Registrar-General, showing the deaths in every 10,000 inhabitants in each district, is important. In the 36 districts, Hampstead is the minimum, 8, and Rotherhithe the maximum, 263. On the north side the river the deaths amount to 42 only in 10,000, while on the south side they number 124. It must also be recollected that under the head of labourers, and those whose occupations are not stated, some important omissions may have occurred, although it is scarcely probable that any medical practitioner would neglect the mention of a nightman, grave-digger, or any other employment that might be supposed likely to induce the disease.

Inferences. First. As regards the influence of occupation.

There is no particular employment, exclusive of locality, that appears especially to predispose to, or excite the disease. These returns disclose one extraordinary fact, viz., that those engaged in some of the most filthy and dirty occupations have been peculiarly exempt from this epidemic. Thus no nightmen, sextons, nor grave-diggers are reported, and those employed about dead animal matter form but a small proportion of the whole. There is only 1 flusherman of sewers, and 1 sewers labourer; the former was 66 years of age. One dustman aged 81. Only 2 male vagrants are reported, and 1 female aged 80; but some may have died in the poor-houses whose occupations were not known. Is it probable that the use of sulphur by these people acts as a prophylactic? This notion is somewhat strengthened by the fact that there are but 8 straw-bonnet makers reported, 1 male and 7 females, and the male was a master furrier as well. Men employed about gas-works appear to have enjoyed a great immunity from the disease. Mr. Holl, the Registrar, says, Sept. 15th:—

> "It is perhaps singular that up to the 15th instant no death nor case of Cholera occurred in the Imperial Gas-Works, Maiden Lane. I inquired of a gentleman connected with the establishment, who told me he had not heard of any case at this or the other establishments at Hackney and Shoreditch. Mr. Fogarty, the medical gentleman under whose care the workmen are, informed me that the men are the most healthy persons in the neighbourhood. However, two cases have occurred, but the first was not a strong man, and rather intemperate; the other had been engaged but three days, and was a kind of superintendent. Is the coal gas destructive of the poison in the atmosphere which induces Cholera?"

The small number of persons attacked who sell spirituous liquors leads to the inference that the *moderate* use of alcohol rather tends to ward off the complaint. I have no means of knowing the number of teetotallers, but I learn that two members of our own profession who died of Cholera were water-drinkers. The dealers in fruit only amount to 25, including 10 costermongers. The mortality has been greatest amongst the labourers, especially on the south side of the river: many of these men were employed about the docks, and in low, damp situations. Sailors also from the same cause have suffered to a great extent, and amongst the latter the number of master mariners and mates is remarkable.

These returns also entirely disprove the prevailing notion that Cholera is a disease confined chiefly to the poor. Gentlemen, master tradesmen, and people in good circumstances were very numerous, but they were generally advanced in age: thus of the 132 gentlemen who died, only 18 were under fifty years of age, and 10 of these 18 were between forty and fifty.

An interesting question presents itself respecting the immunity of those labouring under chronic complaints. These returns show that lunatics (although they enjoy a comparative freedom from many diseases) are not exempt from Cholera. There is reason to believe, however, that although the law laid down by Hunter ("that two diseases cannot exist in the body at the same time") is often erroneous, that it is applicable to a certain extent to Cholera, and that those labouring under chronic maladies are less frequently attacked. Pregnant women appear to have no peculiar exemption. I have seen but one instance during the parturient condition, but Dr. Lever has met with 13 deaths in his own practice, in the present epidemic, and the records in the French journals for 1832 afford many examples.

I now come to the subject of contagion. This question, especially as regards the welfare of the sick poor, is one of great importance. The authorities of Guy's Hospital closed their doors against the admission of Cholera patients, on the ground, as I understand, that the disease might spread to the students and patients in the hospital. It must be borne in mind that this hospital possesses enormous funds; thousands in its vicinity fell victims to the disease; but I believe, if this fear of infection had not prevailed, and if temporary Cholera sheds had been erected, that there would have been a great saving of human life.

But what proof do these returns afford of the contagious nature of the malady? First, of the members of our own profession, 2,567 of whom (according to an Analysis I have made of the London Medical Directory) are practising in London, 17 only have died of Cholera and Diarrhœa; 10 resided on the south side of the river, and 7 on the north; but two of the latter—Dr. Burton and Mr. Key—were attached to the Boro' Hospitals. The ages of these gentlemen were as follows: 23, 30, 36, 39, 40, 40, 41, 42, 44, 45, 47, 47, 50, 53, 55, 57, 76; not one death of a medical assistant, student, or pupil has been recorded; although hundreds of these, as well as of the senior members of the profession, have been in constant attendance upon the sick, harassed by anxiety of mind and almost prostrated by bodily exertion. But contrast these deaths with those that occurred in Ireland in 1847 from typhus fever (Parliamentary Evidence). Dr. Cusac says (2982),

> "We found that 179 Irish medical practitioners, exclusive of pupils and army surgeons, died in the year 1847, about 1 practitioner in every 15, and 64½ per cent. of the whole died of fever."

When in Edinburgh I learnt that about 12 students annually died of fever in that city. Again only 5 chemists and druggists have died, one of these a wholesale druggist and another a lunatic. Not one druggist's assistant nor apprentice has fallen a victim to the disease, but 28 lawyers, including 14 clerks, have sunk under it. Take next the ministers of religion, who it is presumed have been in close contact with the sick: of these there are 2 Episcopalian ministers (one a lunatic), 1 Doctor of Divinity, 1 Wesleyan, 1 Dissenting, and 1 Unitarian. Only 5 undertakers are mentioned, and no sextons nor gravediggers; but I know of one of the latter who recovered from a severe attack. Amongst the 8,088 females there are 38 nurses (7 or 8 of these employed at hospitals), 71 charwomen, and 52 laundresses. The deaths of 1,125 widows are recorded, and I have reason to believe that the husband and wife have often been cut off by this ruthless pestilence, although I am unable from the returns to give the numbers.

It would, I think, be presumptuous for any one to state that Cholera is not contagious under any circumstances; but surely these returns show that it is so, if at all, to a very small extent. It should be recollected that persons who are thought to have taken the disease from the infected, have been exposed to the same deleterious influence as those first attacked. I also believe that many of the supposed examples of contagion, if thoroughly investigated, might be otherwise accounted for. Mental influence, as a predisposing or exciting cause, has probably not been sufficiently estimated. The following example, which occurred to me in 1832, is a good illustration. A healthy boy, æt. 6, saw one of his companions fall into the Surrey Canal; he ran home, his bowels became relaxed, and he died two days afterwards of Asiatic Cholera:—he had not been near a Cholera patient, but he was living in an infected district. A gentleman whom I saw died at Brixton; his wife was much depressed in mind and was frequently over the corpse; she died of Cholera a few days after her husband; but both were living in an infected district, and the lady from night-watching and great anxiety of mind would be peculiarly liable to the disease. A servant, æt. 45 (a very timid woman), who was attended by my friend Dr. Parry, of St. John's Wood, went to visit a relation in Carey Street, Southwark, where she slept on Monday night. There were eight persons dead in the street, and the woman believed that there was a corpse in the house. On Wednesday night she had diarrhœa, and died of Cholera on the following evening. No case of Cholera had occurred in the street where she lived (Abbey Place) previous to her death, nor has the disease appeared since. Fear and exposure to the noxious atmosphere, in this, and many other instances, are, I think, alone sufficient to account for the occurrence of the disease. We know little at present respecting the period of incubation of the poison. The time probably varies much in different cases. In this instance it appears to have been about forty-eight hours. When the poison, or a sufficient amount of it, has been received into the system, the removal into a pure atmosphere does not always prevent the attack, Numerous examples of this kind might be adduced. A gentleman, a friend of mine, who had had slight diarrhœa, and who had been much in the infected districts, went into Essex (60 miles from London) on Friday night, the 31st of August, intending to shoot on the following day; he said that "he felt better after his arrival," but he was seized with violent cramps and vomiting during the night, and died the following afternoon. This is the only case of Asiatic Cholera ever seen in this neighbourhood.

And lastly, as regards the treatment of the disease. This question is, I fear, likely to remain long in as unsatisfactory and uncertain a state as at present, unless a different and more rigid method of investigation be adopted. If at such of our public hospitals whose funds would have enabled them to have received Cholera patients, a different method had been pursued, we might by this time have arrived at more positive conclusions respecting the effects of medicines in this disease. The system I would suggest, if this frightful epidemic should again visit us, is the following:—Three large well-ventilated wards, containing 40 beds each, should be set apart exclusively for Cholera patients, and (according to the present state of our knowledge) three of the most approved modes of treatment should be fairly and extensively tried, in each, under the inspection of medical men appointed by Government. It may be said that the poor should not be subjected to this kind of experiment; but do the rich fare better in this disease? Is not the treatment experimental, and to a great extent empirical? Heat, cold, brandy, ice, aperients and astringents, acids and alkalies, calomel and tartarized antimony, and nearly a thousand other methods, many of them apparently as opposite in their effects as fire and water, have been recommended by different practitioners.

But to return to treatment. It is but fair to state in the onset, that although I saw many cases of Cholera in 1832 and opened several bodies, I have during the present epidemic attended only 20 cases of Asiatic Cholera, and, with one exception, they were all seen with other practitioners; of these 13 died and 7 recovered. It is difficult to draw a useful or practical inference from the treatment, as although Dr. Ayre's plan was adopted in the great majority, other methods had been pursued at the commencement of the attack. I will allude to two or three remarkable cases. First, Mr. C., in the Westminster Road, seen with Mr. O'Shea. This patient was well at one o'clock in the morning (he assured me that he had had no premonitory diarrhœa),* and he died at seven (6 hours). Mrs. H., also seen with Mr. O'Shea, appeared after a few hours to be dying. I injected 60 oz. of saline fluid into one of the brachial veins; the effect, as in many cases recorded in 1832, was most remarkable; the skin became warm, the pulse perceptible, the voice louder and a profuse perspiration bedewed the body, but after a few hours she got into her former state. I again injected about 40 oz. of the same fluid, and she lived nearly 24 hours from the first transfusion. Dr. Ayre's plan of treatment in this case was strictly adhered to, and carried on after the transfusion; indeed, my principal object was to prolong life by the operation, so that the calomel, if of any efficacy, might have a better chance. One bilious evacuation occurred before death. I was anxious in this case, and in some others, to have tried the transfusion of blood and water, but I could not procure the blood. Believing with most practitioners that the loss of the serum of the blood is generally the cause of death, I am afraid transfusion has been too hastily abandoned. I think that in most cases life may be lengthened by it, and in this way the action of medicines may be prolonged.

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* Since this gentleman's death, Mr. O'Shea has ascertained that he had slight diarrhœa for two days before the attack. I mention this to show the difficulty we have often in obtaining accurate information from the patient.

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But the most extraordinary case amongst the above was that of a gentleman, æt. 18, residing in Nelson Square, whom I saw with Mr. Menzies of Stamford Street. He had taken, on the 10th of September (without advice), some blue pill, rhubarb, and effervescing medicine, which relaxed the bowels for a short time; he was tolerably well, however, until Monday evening, when at seven o'clock he vomited once, and purged very profusely. The fluid from the bowels was the clearest I have seen, with a little flocculent sediment. He had taken effervescing medicine, calomel, and opium every half-hour, until I saw him at half-past four in the morning. He was then nearly pulseless; hands cold, feet warm, eyes sunk, voice feeble, great restlessness, and cramps in the legs and hands; tongue and breath warm. I ordered 2 grs. of calomel every 10 minutes; about 24 grs. were taken, but he died at eight, three hours and a half after I first visited him. After taking a few doses of calomel the symptoms appeared to improve; the voice became louder, and the hands and forehead warm. A short time before death he had a sudden evacuation from the bowels; I observed that the skin instantly changed to a blue colour, and he rapidly sunk. Soon after his death, when Mr. Menzies and myself were standing by the bedside, the arms, which were quite straight, were gradually flexed, so that the hands were brought up to the clavicles; at this time no sound was heard, nor motion felt over the heart. I had sent for my transfusion apparatus, and on its arrival I injected a small quantity of saline fluid, but it did not pass readily through the vein. It is remarkable that in this patient the heat increased before death, and the body remained warm for 24 hours after. There is some resemblance between this case and the one which lately occurred at Bristol, in which the warmth of the body continued for several days. I met with another instance of this kind during the present epidemic. I saw one remarkable case of suppression of urine with Mr. Taylor, of Camberwell. A man, æt. 45, who had been in a state of extreme collapse, and whose life was despaired of, took 20 grains of calomel every 20 minutes, for several doses; the quantity was gradually decreased, but altogether 360 grains were taken. When I saw him he was sitting up on the bed, and there was no evidence of oppression of the brain, although no urine had been passed since the attack, then 8 days. Mr. Taylor introduced the catheter, and drew off about a pint of urine, which appeared to have been recently secreted; it was light-coloured, clear, and slightly acid; had not a urinous smell, and on boiling it, *no albumen was perceptible.* This patient died comatose 12 days from the commencement of the disease, probably from the presence of urea in the blood. For several days before his death the secretion of bile had returned.

In forming an estimate of the comparative value of the various modes of treatment, I unhesitatingly give the preference to calomel (a medicine often powerless, as all medicine must be in some cases of the disease), but I believe of more efficacy than any other we are at present acquainted with. I have heard that a learned lecturer on Materia Medica (duly licensed by the authorities), when calomel formed the subject of the discourse, said to his pupils:—"Gentlemen, we are told when we are at a loss at whist to know which card to play, let it be a trump; so, in treating disease, if you are at a loss, give calomel." A late President of the College of Surgeons (Parliamentary Evidence) thought it was not necessary for a surgeon to know the composition of this medicine, so that he knew its effect. Strange doctrines these, but I fear too common amongst some of the members of our profession. But what is the effect of calomel on the liver? Unless we have been greatly in the dark for more than two centuries, it promotes the secretion of bile, and the vast majority of Cholera patients, after this fluid enters the intestines, are in comparative safety. Hence the advocates for the calomel treatment have, at least, a *motive* for the administration of the medicine. Mr. Grainger, now a gentleman of high authority (if correctly reported in the *Lancet* January, 1849, p. 25), recently told the students of St. Thomas's Hospital, "That the secretion of the bile is not arrested in Cholera, but that it does not pass into the intestine." Now, as the gall-bladder is oftenonly two-thirds full, and the amount of bile daily secreted amounts probably to 12 or 16* ounces, it is difficult, according to Mr. Grainger's theory, to understand what becomes of the surplus. But is calomel to be given in all cases of Cholera? In the bilious diarrhœa, the chalk mixture, opium, and catechu, as recommended by the Board of Health, are, I believe, the best medicines; emetics may assist, and other modes of treatment may accomplish the same object: but stop the purging in all cases without delay; keep the patient in a state of quietude, and continue the astringents for some time after the cessation of the diarrhœa.

In the serous diarrhœa, where there is an absence of bile in the intestines, I would at once commence with a grain of calomel and repeat it every half-hour. If the above mode of treatment had been more generally adopted, I believe that there would have been a great saving of human life. If an artery is bleeding, we endeavour to arrest the hemorrhage, and I think it is equally or more important to stop the flow of serum in this disease, for it is the want of proportion between the serous and red particles that is probably the cause of the stagnation that occurs. A larger quantity of pure blood might be lost, and the discharge would be perhaps less injurious! There is one important fact to bear in mind in the treatment of this disease, and it is one that should lead us not to despair of any patient; viz., that in the worst cases there is no disorganization of structure. In the extreme cases of collapse (I can only depend upon the statements of others) I have not witnessed a single recovery; but it is fair to state that in the ten cases of extreme collapse which I saw, Dr. Ayre's plan of giving two grains of calomel (without any other medicine) every ten minutes had not been fully carried out. In five of these cases I have reason to believe that life was prolonged by the calomel; in five others it appeared to be of no efficacy whatever. In 1832 I treated nearly all my patients with emetics, calomel, and opium; in some I combined sulphate of zinc injections *per anum;* but a treatment which appeared to be tolerably successful in the first epidemic would, probably, from the greater malignancy of the present, be of less avail.

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* 24 or 30 oz. would probably have been more correct.

I have omitted many important subjects connected with the origin and treatment of Cholera, but I have already occupied too large a share of the time usually allotted to discussion. I have not spoken of the fungoid theory of Cholera, because I believe there are many facts which militate materially against this mode of origin, and that, like the rice theory of Dr. Tytler, it will soon give place to some new doctrine. I also anticipate that, when the matter is more fully investigated, these cells will be found (both in and out of the body) in districts where Cholera has not yet appeared.

Dr. Ayre, of Hull, has furnished me with the following interesting statement, which he permits me to use:—

> "I am preparing my report, and shall have it out in a day or two, when I will send you a copy of it; the results are somewhat striking. Our medical staff had of necessity a large proportion of the practice in the two parishes; and yet, whilst we have had but 6 deaths in nearly 3,000 cases of diarrhœa, the rest of the practitioners attending in these parishes, and following another treatment, have had 146 deaths. And in the same way, whilst we have 360 deaths from Cholera, they have upwards of 900. There has been no report made of anything but the deaths, excepting by the medical staff, but they cannot have had, it is thought, one-half the paupers that we have had, if even one-quarter, and yet the deaths exceed ours nearly three-fourths."

I am pleased to find that the guardians of Hull have presented Dr. Ayre with £100 for his exertions during the Cholera.

The above paper it must be borne in mind was read four months since, and although the numbers would be somewhat different if all the returns were included, yet these would not affect materially the general inferences. I am anxious not to be misunderstood upon one point, viz. the benefit likely to result from sanitary measures in all our large cities and towns. But the ill effects arising from impure air, water, and diet are not confined to Cholera, and this disease I believe is never solely produced by these agents. For example, in the first week of September the mortality in London was 3,183, and in the following weeks 2,865, 1,981, 1,611, 1,290, 1,075, 1,028, 902, 837, 893, 873, 892, 931, 1,053, 1,002, 1,043, 1,053. So that from the 13th of October to the 29th of December, the deaths for the twelve weeks were 2,348 below the average of the estimated mortality of the season. Now it will occur to every one that during this extraordinary decrease of mortality we had the same drains, cesspools, sewers, open ditches, and burial-grounds, and in addition to the facts I have before mentioned, viz. that persons engaged in some of the most filthy employments have enjoyed a comparative exemption from the disease, I have known certain localities near the river where the stench from the sewers has been almost insufferable and Cholera has not appeared; on the other hand, in places where this disease has been very fatal, no perceptible change existed in the atmosphere. In the event of another visitation of this fearful pestilence, I think great benefit might arise from the burning of certain substances, such as sulphur, tar, rosin, nitre, &c. in the infected districts; but I purpose on a future occasion to enter more fully into this matter.

The above paper was published sixteen years since, and it will now be my object to investigate the leading points connected with the causes, pathology, treatment, prevention, and cure of Cholera, and to inquire what advances have been made in these important matters since I last wrote upon the subject.

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HISTORY AND SYMPTOMS OF CHOLERA.

I NEED say little about the history of Cholera, as it has been fully alluded to by various authors; some trace it back to 1769, and others to a later date; it was not, however, until 1817, that it especially attracted the notice of Europeans, when it occasioned great mortality in the delta of the Ganges; from this point it extended westward in various directions. After hovering about the western parts of Europe, it first appeared in Turkey, 1830. It reached Hamburg in the autumn of 1831, and the first case in this country occurred at Sunderland, October 26, 1831, the disease having been brought from Hamburg in an infected vessel. In the outbreak of 1848-49, the first case in London occurred September, 1848, in a seaman who came from Hamburg, an infected city. In the autumn of 1853, the third invasion of Cholera occurred, but it was in 1854 that it became so fatal, commencing in London with one death in July, increasing weekly until in the week ending September 9, the deaths amounted to 2,050, after which the disease gradually declined.

As is well known, the present epidemic can be traced to the Mecca pilgrims, who died in vast numbers, and according to the *Lancet* (1832), where a history of the progress of the Cholera is given, more than 20,000 of the Mecca pilgrims died of Cholera before it reached this country. In nearly every instance it has travelled westward, and it is said that it always appears first at a seaport, and never attacks the crews of ships going from an uninfected country. The weekly returns of the Registrar-General for London, beginning June 2nd, are as follows: 2, 3, 3, 1, 6, 14, 32, 396, 904, 1,053, 781, 455.

The appearance of the disease at Liverpool, Southampton, Epping, and other places, is too well known to need repetition here.

Symptoms.—These may be comprised in a few words. In the great majority of cases more or less uneasiness of the bowels succeeded by diarrhœa often painless, and of a serous character; this may continue for several days before the accession of grave symptoms; at other times the invasion is very sudden and without warning, violent cramps of the muscles of the abdomen and of the extremities, vomiting and purging of ricewater-like fluid, thirst, feeble pulse, the voice often reduced to a whisper, clammy coldness of the skin, anxious countenance, cold tongue and breath, sunken eyes, blueness of the face and lips, blue finger-nails, shrivelled ends of the fingers, and a death-like change in a short time, that is produced by no other disease. Although, as I have said, preliminary diarrhœa is not in every case present in Cholera, in the vast majority of cases it goes on internally, so that the intestines contain a large amount of fluid before any evacuation takes place. In some instances a large amount of water in the shape of cold, clammy perspirations, is lost by the skin, the diarrhœa in such examples being generally lessened.

After the stage of collapse comes one of reaction and fever; the tongue is furred; delirium not unfrequently occurs, or a stupid listless condition supervenes, owing to the presence of urea, carbonic acid, and other deleterious matters in the system; the pulse becomes full and frequent, the skin hot, and the patient often gets into a low typhoid state. Sometimes an eruption appears on the skin of a rosealous character, but this only occasionally. Of about 190 patients under the care of Dr. Clarke, seven only have been affected with this eruption. The symptoms vary much in different cases; complications may occur, such as pneumonia, quick breathing from stagnation and clotting of blood in the right side of the heart, and in the pulmonary vessels. I scarcely need say, that the return of pulsation at the wrist, improvement in the voice, and the restoration of the biliary and urinary secretions, are some of the most favourable signs.

In children there is a remarkable difference in many of the symptoms; the cramp in the extremities and abdomen are seldom frequent, and the alteration of the features and the blueness of surface are less marked. Of the numerous children admitted into the London Hospital, under the care of Dr. Clarke, Mr. M'Carthy informs me that not one has had cramps of the extremities. I may remark that I have not seen in this epidemic the same marked alteration of features and loss of voice that I witnessed in 1832 and 1849, although the disease has been equally or more fatal; the eruption I have mentioned I did not see in the previous epidemics.

The temperature, as is well known, is very variable in Cholera, and careful observations have been taken at the London Hospital on a large scale. Mr. M'Carthy tells me that the highest temperature he has met with was 105° Fahr., and the lowest 92.

The pulse varies much even in the same stage of the disease; in some persons at the onset being apparently but little affected, whilst in others it is rapid, feeble, almost imperceptible, or absent.

The respiration varies from 18 to 60 in the minute, the rapid breathing taking place when the right cardiac cavities are loaded with blood, and when the nearly stagnant current is scarcely moved by the heart's feeble impulse.

I have recently several times seen a great many patients (more than 100), under the care of Dr. Andrew Clarke, at the London Hospital, who kindly permitted me, with the assistance of his clinical clerks, to make such observations as I desired. I do not allude to the treatment as *at present;* but little practical good can be drawn from it. Dr. Clarke will probably give a summary hereafter. Mr. M'Carthy, a gentleman whose assiduity and great attention to the patients deserves all praise, has kindly furnished me with notes of the leading features of most of the cases. Among these patients, and others in the Hospital, are many of great interest. I will allude only to a few of the symptoms in some of the patients, that cannot fail to interest the reader. Several have suffered from ulceration of the cornea, and one little girl, about two years of age, has lost the sight of both eyes from this cause. One patient that I saw had a semilunar patch of ecchymosis on the inner side of the pupil of each eye, and another had a round ecchymosed spot of the same form on the inner part of each eye. One man had gangrene of the nose and feet; a boy suffered with dry gangrene of the right foot, with loss of pulsation of the femoral artery at the groin.

Pregnancy, as I said in 1849 (p. 7), appears to have no influence on the prevention of Cholera; a great many pregnant women have been admitted into the London Hospital during the present epidemic; of these, nearly all miscarried or aborted. One patient I saw who was at the ninth month of pregnancy, and she had not felt the child for more than a week. On the 15th of August labour came on, and the woman was delivered of a dead child; on the 17th she was doing well; the labour was not prolonged, and was comparatively painless; I saw this woman on the 20th with Mr. M'Carthy, and she continued to improve. On the 20th of August, when the epidemic appeared to be on the decline, a man was admitted in the blue stage of Cholera, whose evacuations were of a pinkish colour from the presence of blood-corpuscles, and other similar cases have occurred.

In my paper in 1849, I spoke of a case where the heat of the skin increased before death, and continued for twenty-four hours after dissolution. A similar case has occurred at the London

Hospital; so great was the heat of the body twenty-four hours after death, in this instance, that Dr. Sutton ordered cold water to be poured upon it before the autopsy was made.

I select from the notes kindly furnished by Mr. M'Carthy, some of the leading symptoms of 30 patients admitted in succession, who died of Cholera in the London Hospital, under the care of Dr. Andrew Clarke. 1. Blood from the bowels, extreme restlessness. 2. Delirium. 3. Never rallied. 4. Great desire for bottled ale, which was given. 5. Stupor, great intolerance of covering, convalescent, again comatose before death. 6. Coma, 12 hours. 7. Fearful cramps. 8. Died on admission. 9. Coma. 10. Dozed until death. 11. Ditto. 13. Cramps and lividity of surface. 14. Dull in intellect and slow in answering questions. 15. Convalescent, then sleepy stage, from which he could not be roused. 15. Never rallied. 16. Ditto. 17. Ditto. 19. Under treatment for diarrhœa a fortnight before, never rallied. 20. Never rallied. 21. Passed into the sleepy stage, hardly waking to take food. 22. Delirious before death. 23. Recovered from collapse, bloody motions, much dyspnœa. 24. Stupor, death in 24 hours. 25. Collapse, rejected the castor-oil. 26. Died in collapse. 27. Reaction set in on the third day, became sleepy and unconscious. 28. Never rallied. 29. Great pain in the abdomen, no reaction. 30. No reaction.

Duration of the Preliminary Diarrhœa.—This is an interesting question, although often a difficult one to solve. Patients when asked will say frequently that they have had no bowel-complaint, but when closely pressed they often remember that the bowels have been relaxed, and the diarrhœa often in the first stage of Cholera is so painless that it excites but little notice. Many of the under-mentioned patients, too, were children, from whom it was difficult to obtain accurate information. It must also be borne in mind that a large amount of fluid *may have accumulated in the intestinal tube before the first evacuation.* From the same notes I extract the period of the occurrence of diarrhœa before admission into Hospital in 68 cases of Cholera.

I divide the cases into those where diarrhœa had existed for hours before admission, and into those where it had continued for one day or more. I need scarcely say that perfect accuracy is not aimed at. *Hours:* 10, 6, 12, 6, 4, 6, 8, 2, 2, 6, 2, 4, 6, 8, 7, 2, 1, 6, 6, 2, 12, 6, 6, 10, 6, 8, 7, 7, 7.

Days: 4, 3, 3, 1, 3, 2, 2, 1, 1, 5, 7, 6, 2, 5, 6, 7, 2, 4, 1, 2, 1, 3, 4, 4, 4, 4, $1\frac{1}{2}$, $1\frac{1}{2}$, 2, 3, 4, 3, 11, 8, 10, 10, 1, 1, 3. In one instance it is said that no diarrhœa or vomiting occurred.

It should be remembered that in the eastern districts of London, from which these patients came, many thousands of persons took opium and astringent medicines for the early diarrhœa, and were quickly cured by locking-up the poison (so called). In Newcastle, during the epidemic of 1849, of 25,583 persons treated by opium and astringents in the early stage of diarrhœa, only sixteen went into the second stage; and innumerable instances of a like kind might be quoted.

Duration of Cholera.—This is a difficult matter to determine, because the preliminary stage, that of internal serous hemorrhage, may have existed for some time before evacuations from the bowels take place, and patients are generally very loose and careless in their statements respecting the existence of diarrhœa. In the subjoined statements respecting the duration of Cholera, it must not be inferred that the time mentioned includes the whole period of the attack. In many instances it is recorded that neglected diarrhœa preceded the Cholera symptoms, and I believe that the choleraic diarrhœa is as much a stage of Cholera as that of collapse. I select from the daily returns for the present month, August 6th to August 25th, the duration of the disease, as stated by 192 medical practitioners, of adult males over twenty years of age. The period of death of women and children I find to be nearly the same. *Hours:* 5, 6, 6, 6, 7, 8, 8, 8, 9, 9, 9, 9, 9, 10, 10, 10, 10, 10, 10, 11, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 12, 13, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14, 15, 15, 15, 15, 16, 16, 16, 16, 16, 16, 16, 17, 17, 17, 18, 18, 18, 18, 18, 18, 19, 20, 20, 20, 21, 23, 26, 28, 28, 28, 29, 29, 29, 29, 30, 30, 30, 34, 34, 36, 36, 36, 60, 64.

Days: 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 7, 8, 8, 8, 8, 8, 8, 9, 9, 9, 11, 11, 14, 14.

It will be seen that 12 hours is the most common time of death after collapse; at this period there are 21 cases, and that during the stage of reactionary fever the third is the day when most deaths occur; 23 of the 181 deaths having been registered on that day. A larger number of returns will be necessary to arrive at accurate conclusions upon this subject.

Rate of Mortality.—This varies greatly in different localities, so much depending upon the period of the epidemic, on its malignity, the class of patients attacked, and the time of treatment. I have reason to believe that in private practice the mortality is much less than that at hospitals, a fact that is readily accounted for. Patients whose circumstances will admit of it are seen earlier, and are kept at rest, a matter of vast importance in the treatment of Cholera; whereas among the poor the exertion required to get to an hospital has often, I believe, an injurious effect.

At the London Hospital up to the present time, according to the Secretary's report (*Times*, August 16), from July to August 16th, 431 patients have been admitted with Cholera, of whom 242 died and 108 recovered. Of 123 persons with choleraic diarrhœa, 84 recovered and 12 died; and yet at this hospital the medical skill is probably equal to that of any in London, and the ventilation of the wards, the nursing, and the various requisites for sick persons are superior to those at most similar establishments.

The rate of mortality in different countries has varied from $\frac{1}{4}$ to $\frac{3}{4}$ of those attacked; some writers believe that the mortality has decreased during the recent epidemics, but of this I think we have no positive proof; indeed, the evidence is somewhat contradictory. According to a statement in the *Lancet*, August 18th, in Russia 7,191 persons had been attacked and 2,856 recovered. In the *Gazette Méd. de Paris*, July 14, p. 464, Dr. Duilboulin stated that Cholera in Holland had been more fatal than in 1849. Of 1,851 persons attacked in Leyden, Lahaye, Rotterdam, and Utrecht, 1,131 died. Dr. Prosper de Pietra Santá, *Epidémie Cholérique*, 1865, Paris, believes that the cholera poison has been less virulent during each epidemic. Thus, in 1832 the deaths were 1 in 40 of the whole population of Paris; in 1849, 1 in 51; in 1853-4, 1 in 112; and in 1865, 1 in 270. This author quotes a large number of authorities to show that the quarantine laws as regards Cholera are entirely useless. Dr. Parkes estimates the mortality in India at about 58 per cent.; in Aleppo more than one-tenth of the population were cut off.

In this country the ratio of deaths to recoveries is only obtainable in hospitals, workhouses, and public institutions; but as I have said before, great variations occur, according to the treatment, locality, and period of the epidemic. The duration of Cholera too is equally capricious; occasionally it remains only a few days in a place, in some localities for months and years. Dr. Macpherson ("Cholera; its Home," 1866) says "that it is never absent from Calcutta;" in this respect bearing a great resemblance to the Cattle Plague in the Russian Steppes.

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OCCUPATIONS.

Occupations.—Some time after my essay was read and printed, Dr. Guy, of King's College Hospital, published a paper, in which he gave the occupations of 4,312 males over 15 years of age that died of Cholera in 1848-49. If this paper be referred to, it will be seen that there is no material difference between his conclusions and my own. Dr. Guy begins at the age of 15, and I at the age of 20; assuming that, until this age, occupations are not settled. Dr. Guy, by means of the census returns and by the London Directory, endeavoured to give a rough estimate of the ratio the deaths bore to the living.

Thus gentlemen and men of independent means are put down at 1 in 200, the whole number of deaths being 135; whilst two fatal cases occurred in rag-sorters; the assumption being that there were only 108 in London, whereas 700 to 1,000 would have been probably nearer the mark. It must be remembered, too, that most gentlemen and men of independent means get out of London during the prevalence of Cholera. Dr. Guy, if his statistics are examined, appears to have lost sight of the fact that the number of master tradesmen mentioned in the Directory is no indication of the number of men employed in the trade. Thus, the dustmen and scavengers are assumed to amount to 234, the ratio being 1 in 37; but the men employed in these trades would be at least five times the number here stated. As in my own table, the men employed in dirty occupations are but few, the tanners were all in a neighbourhood where the disease was specially virulent. But let me now analyze the Registrar-General's report for London, 1853-54, when 10,738 persons died from Cholera and Choleraic diarrhœa; 5,093 males, and 5,645 females.

I select, as before, all males twenty years of age and upwards; they amount to 970. Auctioneer, 1; assistants, 3; artists, 4; agent, 1; bookbinders, 7; basket-makers, 3; butchers, 14; boot and shoe makers, 49; bargemen, 3; builders, 2; ballast-heavers, 2; bakers, 14; bricklayers, 9; block-makers, 2; blacksmiths, 6; boiler-makers, 4; brush-makers, 2; boat-builder, 1; beggar, 1; bonnet-presser, 1; brick-makers, 4; beadle, 1; butler, 1; billiard-table maker, 1; boot-closers, 2; box-maker, 1; bed-hayer, 1; barmen, 2; candle-maker, 1; clerks, 23; cabmen, 7; carpenters, 26; coach-maker, 1; coal-heavers, whippers, &c., 12; commercial travellers, 2; custom-house officers, 2; carmen, 10; coopers, 6; cabinet-makers, 4; carter, 1; cheesemongers, 2; coach-painter, 1; cowkeeper, 1; coal and tar manufacturer, 1; coal-dealers, 2; compositors, 2; corn-trusser, 1; chaff-cutters, 3; coachmen, 5; carver, 1; carriage-greaser, 1; cricketer, a professional, 1; crossing-sweeper, 1; chimney-sweeper, 1; cap-makers, 2; costermonger, 1; cloth-worker, 1; chemists, 2; chaser, 1; coach-trimmers, 2; cloak-maker, 1; cider-merchant, 1; chair-maker, 1; cordwainers, 2; cellarman, 1; dust collectors, 4; dyers, 2; dog fancier, 1; drover, 1; dentists, 2; designer, 1; die-sinker, 1; excavators, 2; engineers, 8; edge-tool forger, 1; eating-house keepers, 2; engine smith, 1; farmers, 2; farriers, 5; fish-monger, 1; firewood dealer, 1; feather-dresser, 1; firemen, 2; furniture dealer, 2; general dealers, 2; ginger-beer makers, 2; gun-maker, 1; gunner, 1; gun-case fitter, 1; gun-smiths, 7; gardeners, 10; grocers, 2; gentlemen, 30; gate-keeper, 1; greengrocers, 4; grooms, 5; glazier, 1; gas-fitter, 1; glove-maker, 1; gold-beater, 1; grave-digger, 1; hatters, 4; hawkers, 9; house agent, 1; hammerman, 1; hair-dressers, 5; house-painter, 1; hotel-keeper, 1; housekeeper, 1; horse-keeper, 1; husbandman, 1; instrument-maker, 1; iron-moulderers, 3; iron-planer, 1; jeweller, 1; labourers, 154; (dock) labourers, 14; licensed victuallers, 8; leather-dressers, 2; leather-dyer, 1; lithographic printer, 1; lead-pencil maker, 1; locksmith, 1; lithographer, 1; livery-stable keeper, 1; licentiate of Apothecaries' Company, 1; mendicant, 1; ministers, 2; maltster, 1; music engraver, 1; (males unknown, 15); milkman, 1; miner, 1; millwright, 1; musicians, 6; mariners, seamen, &c., 60; messengers, 2; missionary, 1; mat-maker, 1; metal-planer, 1; oil-cloth painter, 1; ostlers, 2; oilman, 1; oil boiler, 1; porters, 37; polishers, 5; pensioners, 4; printers, 7; postmen, 4; packers, 3; pawnbroker, 1; prisoners, 9; paper-hangers, 2; plasterers, 5; pressman, 1; plumbers, 2; painters, 14; piano-forte makers, 3; percussion-cap maker, 1; paper-stainer, 1; plate powder manufacturer, 1; railway inspectors, 2; railway plate-layer, 1; silversmith, 1; sugar-bakers, 2; male servants, 8; sawyers, 4; ship-caulker, 1; shepherd, 1; silk-printer, 1; stokers, 8; stonemasons, 3; shawlsmaker, 1; stock-maker, 1; stay-makers, 2; salesmen, 5; seal engraver, 1; singers, 2; schoolmasters, 2; scripture-reader, 1; stationers, 3; surgeons, 2; soldiers, 5; shopmen, 2; scavenger, 1; sadler, 1; silk-winders, 2; shoebinders, 2; tailors, 61; tanners, 5; tin-plate workers, 6; toy-maker, 1; tallow-chandler, 1; tobacco-pipe maker, 1; toll collector, 1; theatrical dresser, 1; undertakers, 3; upholsterers, 2; umbrella-maker, 1; vagrant, 1; venetian-blind maker, 1; watermen, 3; watchmakers, 3; weavers, 6; wheelwrights, 2; whitesmiths, 4; wool-sorter, 1; wool stapler, 1; wine merchants, 3; wood-cutters, 2; waiters, 3; waistcoat-makers, 4; warehousemen, 3; wire-worker, 1; whitening manufacturer, 1; wine cooper, 1.

In these 970 returns it will be seen that there are only two surgeons, one member of the Apothecaries' Company, and two ministers; and among the occupations that might be supposed to predispose to Cholera are only one scavenger, one grave-digger, and four dustmen. There are 30 gentlemen; and tailors and shoemakers, as in the last return, form a large proportion, 61 of the former, and 49 of the latter. The sedentary occupations of the members of these trades and their remaining so long in the same atmosphere may account for the great mortality among them. It is worthy of note that there is one coal and tar manufacturer. Labourers, as in all the returns, form a large proportion, as do sailors and mariners.

Let us now take the printed returns for the Metropolis during the present epidemic. These daily returns were commenced on the 6th of August and extend to the 25th. Before this date the number of weekly cases of Cholera, beginning June the 2nd, was 2, 2, 3, 1, 6, 14, 32, 346, 904, 1,053 ending August 4, so that a large number of the employments are not obtainable. The occupations of 340 males 20 years of age and upwards are as follows:—Auctioneer, 1; barman, 1; bookbinder, 1; basket-maker, 1; butchers, 4; bootbinder, 1; bargemen, 3; builders, 2; ballast-heavers, 4; bakers, 4; bricklayer, 1; blacksmiths, 3; blockmaker, 1; candlemaker, 1; clerks, 6; cabmen,

2; carpenters, 12; chairmaker, 1; coachmaker, 1; coal-heavers, 3; commercial traveller, 1; custom officer, 1; carmen, 6; coopers, 5; cabinet-makers, 3; coal merchant, 1; carter, 1; carvers, 2; cowmen, 2; cheesemonger, 1; dyers, 4; dock constable, 1; earthenware dealer, 1; engineers, 2; farriers, 4; fishmonger, 1; fruit salesman, 1; foremen, 3; furniture dealer, 1; fur-puller, 1; general dealers, 4; gunsmiths, 2; glass-blower, 1; gardener, 1; grocers, 2; hatters, 3; hawkers, 4; house proprietor, 1; instrument maker, 1; iron-founder, 1; iron-moulder, 1; jeweller, 1; labourers, 75; labourers (dock), 14; licensed victuallers, 3; letter-carrier, 1; looking-glass maker, 1; musicians, 2; mariners, sailors, &c., 20; messengers, 2; organ player, 1; porters, 15; polishers, 2; policemen, 4; pensioners, 3; printers, 4; packers, 2; pewterer, 1; pawnbroker, 1; potman, 1; pier-master, 1; poulterer, 1; railway inspectors, 2; rag-sorter, 1; tailors, 8; traveller, 1; travelling showman, 1; tobacco operative, 1; tinplate worker, 1; tobacco-pipe makers, 2; umbrella-maker, 1; upholsterer, 1; shoemakers, 13; saddler, 1; silk-weavers, 7; silversmiths, 2; sugar-bakers, 6; shipwrights, 5; stovemaker, 1; stereotyper, 1; servant, 1; sawyer, 1; silk-dyer, 1; stokers, 2; shopkeeper, 1; waterman, 1; watchmaker, 1; weavers, 5; wadding-maker, 1; warehouseman, 1; wheelwright, 1; watchman, 1; whitesmith, 1.

As I have said before, the occupations were first published on the 6th of August, previous to which period more than 2,000 persons had died of Cholera in London. In comparing the occupations of persons dying during this present epidemic and those of 1849, 1853, 1854, it is necessary especially to take into account the rank and grade of the inhabitants in the localities affected. Thus, in 1849 the returns included 132 gentlemen; in 1853, 1854, 30 gentlemen were registered; but among these 348 persons that died during the present month, not one death among gentlemen (so-called) is recorded, the locality being amply sufficient to account for the circumstance. As I have said elsewhere, one medical man, Dr. Ansell, of Bow, died before the 6th of August, and therefore his death is not recorded in these returns.

As regards the influence of dirty and filthy occupations, these returns, like those of 1849 and 1854, fully bear out the correctness of my first conclusion, so that the addition of the 1,310 occupations to the 4,258 already published, when class and locality are taken into account, makes but little difference in the inference. There is a prevailing error that only the ill-fed and destitute are generally affected with Cholera. During the present epidemic in the east of London, some of the most filthy and overcrowded neighbourhoods have been specially exempt from the visitation. Thus in Poplar, Bow, and Stepney, the mortality has been more than double that of Bethnal-Green. Those who have seen the great number of fine, strong, muscular men, women, and children in the deadhouse of the London Hospital must have come to the conclusion that it is not a question of strength, or power of constitution, but that Cholera poison is as likely to kill the strong and the muscular man as it is the weak and enfeebled, although those living in a pure atmosphere are less likely to take the disease. To repeat my words used in 1849 (p. 2), this inscrutable agent has certain powerful assistants in its train, such as a moist atmosphere, animal and vegetable malaria, depression and anxiety of mind, certain articles of diet and drink, and probably some trades and professions. If the west end of London should again unhappily be visited by Cholera, let not the residents who are well fed and well cared for indulge in any such false security as the belief that Cholera is a disease chiefly confined to the poor. The upper and middle classes have many advantages over their poorer brethren, such as early treatment and nursing, a purer atmosphere ; but the history of Cholera in all countries shows that although the disease has been more fatal among the lower orders, those living in crowded localities and in a damp and vitiated atmosphere, yet it has numbered amongst its victims a great many of what are called the "better classes" of society. I mention this that all may be impressed with the importance of early treatment, and of the necessity of at once arresting the diarrhœa.

Before I conclude this chapter, let me allude to some prevailing errors that have been extensively circulated by the public press. It has been said that people employed about gas-works have been exempt from Cholera. It is probable that in the returns for 1849 and 1854 some of these are classed among labourers ; but during the present epidemic I have met with two men in the London Hospital employed in gas works, and I have reason to know that many so employed have been affected. Another error is the belief that Jews are specially exempt from Cholera. During previous epidemics this may have been the case to a certain extent in this country, but I have seen a great many Jews in the London Hospital with Cholera during the present month ; and I believe in other countries they have not escaped the disease. The statement about the exemption of cider-drinkers has probably no better foundation. In my essay, 1849, I stated that of the 17 medical men who died in London, two were water-drinkers, and that the moderate use of alcohol probably tended to ward off the disease.

Dr. Snow, in his excellent work on "Cholera," 1855, p. 122, quoting from Dr. Guy's table, says, "One master brewer died of cholera, being 1 in 160 of the trade ; but no brewer's man or brewer's servant is mentioned as having died of this malady ; Dr. Snow naturally attributing these exemptions to their abhorrence of water." He further states, p. 124, "that on looking over the returns he has met with two or three of these persons, and that there must be a few thousands of them in London."

In my first return there are 6 brewers, and 40 licensed victuallers, beershop-keepers, and barmen. In the returns for 1853 and 1854 there are 2 barmen and 8 licensed victuallers. In the imperfect returns for the present month there are 3 licensed victuallers ; so that there is a fair proportion of spirit-drinkers. I am a water-drinker myself, and I am fully alive to the evils resulting from the immoderate use of alcohol—poverty, crime, dirt, laziness, and bodily decay and suffering are its almost constant attendants ; but I am not sure that a moderate use of alcohol during a Cholera epidemic is not desirable, and probably good unadulterated malt beverage is the best.

CAUSES.

Water.—One of the most frequent causes of Cholera is supposed to be water which contains the germs of the disease from excreta that have entered it by means of sewers, water-closets, and other methods. As is well known, the late Dr. Snow * was one of the first to promulgate his belief that the great majority of choleraic cases were occasioned in this manner, and the example so often quoted of the Broad Street pump was especially given in proof of the correctness of his theory. To quote from his own report on the Cholera outbreak in the parish of St. James's, Westminster, during the autumn of 1854,—" The evacuations of Cholera patients found their way into this well. From the 19th of August, 1854, 616 persons died of Cholera in this district, but after the handle of the pump was removed, on the 9th of September, the mortality fell to one or two daily." Mr. Whitehead, in the same report (page 132), says,—" Of the drinkers of the pump-water, the ratio of those attacked to those who escaped is at least 80 to 57, whilst the corresponding ratio of non-drinkers of that water was but 20 to 279." Mr. Yorke (page 170) also adduces evidence of a like nature. Dr. Snow and others have produced other facts to show that the water has generally much to do in the production of the disease ; and the result of the present epidemic in the east end of the metropolis appears to confirm the correctness of Dr. Snow's opinion, for at the present time (August 24th), of those who have died of Cholera in the east of London, nearly all have drunk the water of the river Lea. According to the Registrar-General's report, the six districts supplied from the Old Ford reservoir of the East London Water Company have suffered from the ravages of Cholera to a remarkable extent. Thus, the mortality in Bethnal Green has been 30 per 1,000 ; Mile End, 50 ; St. George's-in-the-East, 60 ; Whitechapel, 70 ; Poplar and Bow, 70 ; and Stepney, 80 per 1,000 ; whilst the other metropolitan districts have suffered comparatively but little from the epidemic. It must be observed that the rate of mortality does not correspond with the poverty of the inhabitants. During the epidemic of 1848–9, the greatest sufferers were those who drank the Thames water, then in a very impure state.

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* " Mode of Communication of Cholera," 1855.

But in these instances, and in others that have been adduced, what proof is there that human excreta have entered the water? In the case of the Broad Street pump, and in the remarkable instance that recently occurred at Epping it is more than probable that such a contamination occurred, and so with the Thames and other rivers polluted by sewage. There are some facts, however, that appear to militate against this theory, especially the remarkable exemption that I was the first to notice in 1849, of sewers-men and nightmen from Cholera. It may be said that these men are not water-drinkers, but their habits are not very cleanly, and they are constantly exposed to the influence of sewage. Again, if the water produces the deleterious effect attributed to it, how does it happen that Cholera subsides often very suddenly, although it is impossible to suppose that any material change can quickly take place as regards its purification? And it is a curious fact, as shown in the report of the Medical Officers of Health, and in Dr. Letheby's report, that London water has been unusually free from impurities. It may be said, however, that the germs of Cholera poison from human excreta may multiply rapidly, and that it is impossible to detect them by any means that we are acquainted with. There is another fact that I think is beyond dispute, viz., admitting that the water drunk is the most frequent cause of Cholera, a vast number of cases cannot originate in this manner. The important matter to determine hereafter will be whether certain impurities exist in the water, irrespective of choleraic contamination, that may act as exciting or predisposing causes?

I have carefully examined several specimens of water microscopically before mixture with Cholera evacuations, and some time after this adulteration. Let me briefly allude to some of them. To 2 oz. of water, taken from a water-butt, I added on August 20th twenty drops of recent Cholera evacuation. On the 15th of August I carefully examined this fluid under various powers from 60 to 1,000, and the only remarkable change was the enormous quantity of one species of infusoria (*paramœcium*), and also of active monads. There were present also fungous threads and some of the supposed Cholera cells, or bodies very like them, as figured by Drs. Brittain and Swayne, in the *London Journal* of 1849. In the Cholera water where the fishes had been confined, I did not find one infusorial animal. I mention this to show that fresh-water fishes are great scavengers and purifiers of water, although I believe that all the infusoria in the world would not *alone* produce Cholera. I gave some of the fluid first named to a rabbit, a white mouse, and a pigeon, without producing any apparent effect upon any of them.

Effect of Cholera Evacuations upon the Lower Animals.—In the *Medical Times and Gazette*, 1854, vol. i. p. 182, it is stated that a dispenser at the Newcastle Infirmary drank, by mistake, some rice-water evacuation without any injurious effects. I am not aware that any well-conducted experiments have been made upon the lower animals, for the purpose of showing the effect of this assumed Cholera poison. I have performed the following experiments not without mature and due consideration, for I hold that no experiment should be made upon any animal without it can be clearly shown that it is likely to be of service to suffering humanity.

The question as to the influence of human excreta in the production of Cholera is one of great importance, and it is on this account that I have instituted the inquiry. The experiments were made in a detached building, under lock and key, and I took care to bury all the excreta of the animals employed.

Aug. 18, 1866.—A drachm of the rice-water fluid from the bowels of a Cholera patient taken the day before, was put into a glass globe containing two quarts of water, in which was a small carp and two gudgeons. These fishes were watched for some time, and no perceptible effect was produced upon them. The next morning the gudgeons had disappeared in a mysterious manner, but the carp was lively and apparently healthy; it remained for three days, apparently unaffected.

Aug. 22.—Two small carp were placed in a glass jar containing a quart of water; to this a fluid drachm of rice-water from the bowels was added, the fluid having been taken five days before and kept in a stoppered bottle. It was in a state of ferment; the fish were kept for five days in this fluid; and, like the last named, were, as far as I could judge, uninjured.

Aug. 20.—A healthy frog was treated in the same manner as the above. After remaining two days, it was apparently unaffected, and was set at liberty. A second, with the above discharge in a state of ferment, afforded the same result.

A healthy pigeon was fed upon peas. These had been immersed in the same fluid, after having been kept for five days in a stoppered bottle. The bird, after five days, was to all appearances well, although it also drank water mixed with the Cholera discharges.

Aug. 19.—A hedgehog was fed on meat and egg, containing the first day a drachm of the same fluid, and the next day the same quantity was taken. After four days the animal was liberated from the box, no perceptible effect having been produced.

Aug. 19.—A kitten three-fourths grown was treated in the same manner and with a similar result.

A rabbit about one-third grown had Cholera evacuations that had been kept from five to eight days mixed with its oats and cabbage; after three days it was liberated without apparent injury.

As I shall endeavour to show in the Appendix, the diseases of man and those of the lower animals differ so materially that I scarcely expected that these evacuations would produce an injurious effect upon the animals taking them. The animals were all kept so that the evacuations could be carefully examined. No important good results from these trials; but if the animals had had symptoms of Cholera, the experiments, would have given great support to the water theory. I may add that I have had an opportunity of watching most of the animals up to the present time, and that they appear to be perfectly healthy. Other modes of experiment, such as injections into the veins, have occurred to me; but I am glad to escape on *this occasion* with an easy conscience, and I gladly abandon them, believing that no positive good would result.

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CONTAGION.

Contagion and Infection.—Although as I have said in my first paper (p. 7) that Cholera is contagious only to a certain extent and in a very limited degree when compared with small-pox, scarlatina, and other zymotic diseases; yet there can be no doubt that a vast number of cases can be traced to infection, and in a great many instances where it appears in a fresh locality some clue is afforded as to its mode of ingress; thus, it is tolerably certain that the late outbreaks in Dublin and Belfast may be traced to the importations from Liverpool, and so with the remarkable case at Epping, and a great many others that could be enumerated.

In commenting upon the influence of trades and occupations (in 1849, p. 5), I have fully shown that persons especially exposed to the influence of the poison, such as medical men, students, clergymen, and nurses, have not been more affected than others who have been away from Cholera patients. In 1849 only 17 medical men died in London of Cholera, and not one medical student, whilst 28 lawyers and law-clerks, 14 of each, fell victims to the disease.

In 1853-1854, as will be seen by the statistics, only two medical practitioners died of Cholera in London, whilst during the present epidemic I only know of one medical man in England, Dr. Ansell of Bow, who has died from this cause.

During the recent outbreak of Cholera at Amiens two physicians have died and several inmates of the hospital, but those acquainted with this town, which possesses all the requisites for the propagation and spread of Cholera, will not be surprised at this. During the present outbreak, of 70 nurses at the London Hospital, who have attended upon 559 patients with Cholera and choleraic diarrhœa, four have been attacked, three of them slept out of the hospital, and one was a regular nurse. It must be borne in mind that this hospital, as was the case at Amiens, is in an infected district. In the medical and surgical wards not a single patient, I believe, has been affected with the disease; but at Vienna, Amiens, and other places, many inmates of hospitals where Cholera patients have been introduced have suffered.

There is one circumstance that demands especial attention, viz., the liability of women who wash the clothes of the infected to take the disease. Many examples of this kind are on record; but then it must be remembered that these persons are mostly in infected localities. Assuming that the disease is conveyed in this manner, does the poison enter the body by the skin or by the lungs, and what influence has the increase of temperature in favouring its ingress? From the numbers of persons employed about dead bodies and their singular exemption from the disease, I am induced to believe that warm water may have favoured the introduction of the poison in the cases first mentioned.

In the Report of the Cholera Committee of St. James, Westminster, 1855, page 19, from which I have before quoted, occurs the following: "Of the 825 houses in this area, fatal attacks of residents occurred in 313; there were 159 houses having single deaths; 85 with 2 deaths; 34 with 3; 15 with 4; 12 with 5; 3 with 6; 4 with 8; and 1 with 12. There were no less than 21 instances of husband and wife dying within a few days of each other," a circumstance I have alluded to in my first essay; grief, I believe, acting as a depressing cause.

To show that something has been done towards the elucidation of this question of contagion I extract the following recommendations of the Board of Health, with Sir H. Halford, the President of the College of Physicians, at its head, October 20th, 1831: "Rags, papers, and cordage should be burnt, and the victims burried in detached ground." "All articles of food shall be placed in front of the house, and taken in when the person carrying them shall have retired." "Convalescents should be kept under observation for twenty days." "It may be necessary to draw troops and police around the infected place."

Before I finish this chapter I refer the reader to page 7, to the account of the mortality among medical practitioners during the famine fever in Ireland by way of contrast.

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PATHOLOGY.

Before I speak of the pathology of Cholera, let me briefly allude to a physiological question of great importance upon which the theory of Dr. Johnson mainly hinges, viz. spasm of the minute pulmonary arteries. Dr Johnson says,—"I suppose that no physiologist of the present day will deny that spasm of the arteries is as real a fact as spasm of the muscles." (P. 50.)

Dr. Johnson will not, perhaps, class me with the physiologists of the present day; but I have devoted a good deal of attention to this study for the last fourteen years, and I hope that my labours are not altogether fruitless. I first deny that spasm can take place in any but a muscular structure, and I moreover assert that there is no proof that spasm ever takes place in an artery or in an extreme vessel.

I have long been looking for the proof, and shall be pleased if Dr. Johnson or any physiologist will furnish me with it. In 1848 Dr. Hughes Bennet was a candidate for a university chair in Edinburgh. He told the learned Town Councillors in his trial dissertation by a kind of Scotch *concours*, which very properly elected him, that the doctrine taught by Cullen in that university of spasm of the extreme vessels was proved to be perfectly true. In the next room to the lecture-room were a large number of microscopes, some of them showing the circulation of the blood, and I asked Dr. Bennet to give us proof of the correctness of his assertion. Dr. Bennet and others assume that the application of stimulants and other agents to a vessel, and the consequent stoppage of the blood, is a proof of its muscularity; but I believe the effect is simply mechanical. If spasm of the extreme vessels were possible, I fear that we should be often subject to greater evils than those even occasioned by the Cholera. It is a mere assumption unsupported by proof. But, assuming that Dr. Johnson's theory of spasm of the minute arteries is correct, what a labyrinth of difficulties we get into if we take the doctor's views of the question. If these pulmonary arteries possessed muscular fibres, and they were in a state of spasm, what so likely as opium to relieve them? And could the advocates of the opium treatment, if they are converts to Dr. Johnson's spasmodic theory, have a better proof of its correctness? But, unfortunately for them, Dr. Johnson ignores both opium and the warm bath. This question in relation to spasm of the minute arteries does not refer to Cholera alone, but it is one of very wide application, and therefore I have made it prominent.

In Cholera there is no special disorganization of structure in the first and second stages, except the loss of a large amount of the epithelial lining of the intestines and other parts, as evidenced by the microscopical examination of the alvine evacuations, and by the appearances after death. The hyperemia that is seen in some organs, appears to me to be due rather to the loss of the *vis a tergo*, the failing powers of the heart, and to the thickened state of the blood. The central organ is unable to propel the thickened blood through the system; hence the loaded condition of the right cardiac cavities, and the comparatively anæmic state in many instances of the pulmonary organs. In the third or reactionary stage, congestion of the lungs, kidneys, and other organs, may be met with, that are not present in the stage of collapse. The small size of the spleen and its firm texture in most cases, forms a remarkable contrast to its appearance in fever and in other diseases of a low type. There is one important circumstance in the pathology of Cholera that demands, I think, more consideration than it has met with from pathologists and physiologists. The suppression of the urinary secretion and the injurious influence of urea, have been fully alluded to by some pathologists, but the effect upon the system of the bile secretion has not been, I think, properly appreciated. The gall-bladder is, in the great majority of cases, distended with thick bile; the liver is somewhat congested, and bile may be squeezed out of the cut bile-tubes; but, judging from the contents of the intestines, but little bile passes into the alimentary canal; indeed, one of the most favourable signs in Cholera is the presence of bile in the evacuations. What becomes of this secretion? I have already alluded to this in my former paper, the liver, the great depuratory, blood-forming (as I believe), and heat-giving organ, ceases to secrete, its normal quantity of bile being from 20 to 24 oz. daily. I quote from my Essay "On the Morbid Conditions of the Bile and Gall-Bladder," *London Medical Examiner*, p. 227, vol. ii.

I have ascertained by measurement that the gall-bladder of an adult holds from ten to twelve fluid drachms of bile, and that of a child fourteen months old two drachms. It is difficult to ascertain the exact quantity of the fluid secreted daily by an animal in a healthy state. In cases of fistulous openings, where the bile has been daily collected, it may be said that the liver is in an unnatural condition, and that its secretion may be more abundant. Taking the size of this organ into account, as well as the experiments that have been made by various physiologists, it is probable, I think, that the amount of the secretion has not been much overrated. L'Héretier mentions a case of biliary fistula, in which about 16 oz. of bile escaped in twenty-four hours, and probably all the secretion did not pass through the fistulous opening. Haller estimated the quantity at 24 oz. in the twenty-four hours in man; Burdach from 17 to 24 oz.; Liebig 24 oz. In the horse the quantity daily secreted is supposed to amount to 36 lb.; in the ox 37½ lb.; and in the dog to 36 oz.

If the greater part of this fluid in a normal state is burnt in the circulation and affords fuel for the respiratory apparatus, the loss of temperature and the sudden sinking can readily be accounted for, without having recourse to the speculative theory of spasm in the extreme vessels. I believe, moreover, as I have often publicly stated, that the liver has more to do with blood-formation than any other organ, and that the assertion made by Professor Bennet, of Edinburgh, that the spleen and other ductless glands secrete the blood, and that of Kölliker and others, that the corpuscles are destroyed in the spleen, are equally erroneous. But to return to morbid influences. Unfortunately many of nature's secrets are at present hidden from us, and those connected with the pathology of Cholera are especially deep and obscure; but although we may not be able properly to interpret the phenomena, the suppression of the biliary and urinary secretions and the disintegration of the blood, are alone sufficient to account for the fatal results.

The feeble heart, the pulseless wrist, often for many hours before death, and the loss of the suction power of the auricle, are, I think, amply sufficient to account for the condition of the heart and lungs, without having recourse to such speculative theories as spasm of the minute pulmonary arteries. But what do Dr. Johnson's own cases prove? In his work on Epidemic Cholera and Diarrhœa, 1854-55, cases of Cholera and diarrhœa treated at King's College Hospital are recorded, and as far as the pathology is concerned, it does not, I think, tend to support his conclusions. Fourteen of the fifty-four cases were fatal, but examinations were not permitted in all. Let us see the condition of the heart and lungs in the inspections that were made. The numbers indicate the cases, which can readily be referred to. "Case 9.—Heart contained a small quantity of blood; lungs pale and sanguineous. Case 10.—Intestines pink; other viscera healthy. Case 11.—Lungs pale and exsanguineous; heart healthy. Case 23.—Viscera of chest healthy; lungs not so anæmic as usual. Case 35.—Lungs much congested; reactionary stage. Case 37.—Fatty heart; lungs healthy. Case 45.—Coma during reaction; heart healthy; lungs congested at the back and base."

That the lungs are specifically lighter in the vast majority of Cholera cases Dr. Parkes and many others have long since determined, but I believe that the anæmic condition arises from the causes I have enumerated, and not from spasm of the arteries. Assuming that the stoppage of the blood depends upon spasm of the pulmonary arteries, Dr. Johnson is wrong in supposing that the spasm is relaxed during reaction, for in a great many cases this anæmic condition of the anterior parts of the lungs is found in the reactionary stage. If Dr. Parkes' cases are carefully examined, I believe it will be found that they give no support to this doctrine of spasm of the pulmonary arteries.

As I have said before, I made several autopsies in 1832 of persons dying of Cholera. Through the kindness of Dr. Andrew Clarke and Drs. Hughlings Jackson and Sutton, I have been present at the undermentioned inspections at the London Hospital, with a view especially to test the correctness of Dr. Johnson's statement respecting the condition of the lungs and heart in reference to the assumed existence of spasm in the minute pulmonary arteries during life. The notes are taken from my own observations.

Aug. 7. Case No. 1.—Girl, æt. 5 years; collapse. Examined by Dr. H. Jackson. Brain normal; no serum in the ventricles; lungs, upper part anæmic, but not destitute of blood, and on exposure to the air when a section was made, the surface became red. The lower and depending parts congested with fluid blood ; heart *in situ ;* the right auricular appendix distended. On cutting into the auricle and ventricle, a large quantity of thickish black blood was seen, some of it semi-coagulated ; a less quantity was present in the left cavities ; in these it amounted to about one ounce. The liver slightly congested ; gall-bladder full of thick dark bile ; the kidneys normal in structure ; the cortical part pale, the medullary portions red and congested ; the spleen firm and healthy, but very small. The stomach contained a white pultaceous matter ; in the duodenum, and in other parts of the tube, a thick white creamy greenish fluid was present.

Examined, with Dr. H. Jackson and Dr. Sutton, the bodies of two boys, one about sixteen years of age, the other fourteen, who died of Cholera in the stage of collapse. One boy came from Guernsey, and drank the same water on board the ship that the other sailors drank, and declared that he had not tasted any other water.

Case 2. Aug. 7.—A strong muscular boy. I need not recapitulate all the morbid appearances, as they much resembled those above described, except that in this case the right cavity of the heart was more distended with dark fluid, semi-coagulated blood, with a soft fibrinous clot adhering loosely to the parietes. The left ventricle contained about three ounces of semi-fluid blood. In this case the pericardium at the base of the heart was studded with minute ecchymoses and extravasations, not unlike those seen in cattle plague under the endocardium in the left ventricle. The stomach of this boy was lined with a greyish-white pultaceous matter, that somewhat resembled calomel, and as calomel had been given in rather large doses it was at first inferred that the medicine had remained unabsorbed on the mucous membrane. On careful examination, however, the matter appeared to be composed chiefly of curdled milk, but no chemical* examination was made. The liver, kidneys, and spleen were in the same condition as last described. In this boy the mesenteric glands were more than double their natural size, and the intestinal solitary glands were also large. Peyer's patches were more vascular than usual. The large intestines likewise contained the same pultaceous fluid, and small yellow excrementitious masses were present in some parts. Peyer's patches presented no abnormal appearance, nor did the solitary glands. Externally some parts of the small intestines were of a pinkish hue, the lower and depending parts being more congested. The urinary bladder contained about an ounce of urine.

Case 3.—The morbid appearances in this boy were much the same as in the first case, but in some parts of the small intestine there were ecchymoses and red patches, producing a mottled appearance. The aorta contained an unusual quantity of semi-fluid blood ; the urinary bladder empty ; gall-bladder full of thick bile.

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* In a somewhat similar instance Mr. Dove told me that the deposit was chemically examined, and no calomel found.

In the second case the rigor mortis was well marked, in the other cases it was less so. I carefully examined the blood, intestinal contents, and intestinal villi in these patients.

The blood-corpuscles were lax, yielding, not assuming the same rounded form as in healthy blood, but when dried on glass, the appearance was more natural. The intestinal discharges all contained a large amount of epithelial cells, and the villi were generally denuded.

Case 4. August 13.—A girl about 20 years of age died in the early part of the reactionary stage; the left side of the heart contained about 3½ oz of dark fluid blood, the right side about 5 oz., the spleen normal. The stomach contained a dark grumous fluid, the lining membrane ecchymosed in several parts with round small spots of extravasated blood; a few of these were seen in the intestines. The gall-bladder full, the urinary bladder empty, and coated with thick pus. The brain congested externally, but the interior free from blood; no serum in the ventricles.

Case 5.—Boy, æt. 6, died in the early stage of collapse. The left ventricle of the heart contained 1½ oz. of blood, the right six drachms; a portion of the right lung soft, and, from recent inflammation, left congested. The bronchial tubes lined with purulent matter. The stomach ecchymosed in several parts, and the lower part of the œsophagus stained and spotted from extravasation of blood. Small patches of ecchymosis were also seen in the intestines.

Case 6.—A girl, æt. 4, died in the early stage of reaction. The lungs anæmic. The quantity of dark fluid blood in the sides of the heart about equal. The right lung weighed 2 oz., the left 2½ oz. The vessels of the brain congested externally. The cerebral substance normal. No fluid in the ventricles.

Case 7.—Child, æt. 2. The morbid appearances differed but little from those last named, and the brain was much in the same condition.

Case 8. August 15.—Autopsies performed by Dr. Sutton. A strong powerful woman, about 30 years of age, died in the reactionary stage, five days after the commencement of the attack. The lungs much congested; both sides of the heart contained fluid black blood in about equal quantities, with a small fibrinous clot in each of the cavities. The whole tract of the alimentary canal was singularly free from congestions or ecchymoses; the external part of a pinkish hue. The lining membrane covered with the white pappy matter before described. The cortical part of the kidney pale; the medullary portions of a dark-red colour. Urinary bladder empty.

Case 9.—A girl, 6 years of age, died in a state of collapse. The lungs rather anæmic anteriorly, congested posteriorly; weight 9 oz. The heart contained less blood than usual. The intestinal canal of this girl, like that described in the preceding patient, was to the naked eye apparently free from any trace of disease. Peyer's glands and the solitary glands were quite normal, and the intestinal mucous membrane of a pale whitish colour.

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In all the above autopsies the viscera were weighed, and in those not noticed nothing remarkable was observed.

Case 10. August 20.—A man, 45 years of age, died in the reactionary stage. The lungs much congested; left 18½ oz., right 16½ oz. The right side of the heart contained about 4 oz. of blood; the left 2½ oz. The intestinal tube contained a greenish-yellow matter, the colour apparently produced by bile; the mucous surface to the naked eye healthy. The gall-bladder distended with about 6 oz. of bile. Spleen small. Cortical portion of the kidney pale; the mamillary part red and congested. The renal bodies and the thyroid gland normal, as was the pancreas.

Case 11.—A woman, æt. 40, died in the reactionary stage, after several days. The anterior part of the lungs anæmic, posterior parts congested; weight of right lung 16 oz., of the left 11½ oz.; a long, loose, fibrinous clot extending into the pulmonary artery. A large quantity of dark-coloured blood on the right side of the heart, less in the left cavities. Other organs as described in the last-named autopsy.

Case 12.—A woman, aged about 30. Both lungs much congested. The heart contained black fluid blood on both sides, but no clots or fibrinous deposits. The gall-bladder much distended, and some yellow fæcal matter in the large intestines, of an offensive smell. The mucous surface, as in the preceding cases, healthy to the naked eye. Nothing worthy of note about the remaining organs, except an ovarian tumour, about the size of a cocoa-nut.

I could add largely to these autopsies, but the above twelve examinations will suffice, I think, to give the general characters of the morbid appearances in cholera; viz., congestion of the right side of the heart, a smaller amount of blood in the pulmonary structure, and the consequent diminution of weight of the lungs; a somewhat congested liver and full gall-bladder. The cortical part of the kidneys pale, the medullary portions red and congested, with a small quantity; a viscid urinary secretion in the pelves. The renal bodies normal, as are the pancreas and spleen, the last-named organ firm and diminished in weight. The intestines often externally present a pinkish appearance, in other cases they are partially congested. The mucous membrane of the stomach, and the lower part of the œsophagus, often ecchymosed and stained; the gastric membrane not unfrequently covered with a white viscid pap-like matter, as is the lining membrane of the intestines. The intestinal tube often contains a large quantity of the peculiar rice-water secretion; the mucous membrane being in many instances unusually pale and white. The urinary bladder is contracted and empty; the vessels of the dura mater somewhat congested; the substance of the brain normal, and the ventricles free from fluid. Other lesions may be present, depending upon the stage of the disease, such as emphysema, extreme congestion of the lungs, inflammation of these organs, extravasations of blood into the alimentary canal, great congestion of the brain, enlargement of the parotid and other salivary glands, stains and ecchymoses of the pericardium at the base of the heart.

The great loss of epithelial scales on nearly all the thoracic and abdominal mucous surfaces, is another point of particular interest.

Judging from my own observations, persons labouring under chronic maladies are less liable to cholera; but a more extensive examination is necessary to determine this.

The state of the blood demands especial notice.

The Blood.—There is one expression in the first published essay that requires explanation; the blood is described as tarry and treacly, but this was intended to refer more to the appearance than to the actual consistence of the sanguineous fluid; the blood is generally thick, black, fluid, and some portions of it semi-coagulated. It has been chemically examined by O'Shaughnessy, Parkes, Schmidt, Beckerel, Garrod, and others. Dr. Garrod (*London Journal of Medicine*, 1849, p. 436) says "that cholera blood can readily be distinguished from any other blood." Taking Beckerel's standard for healthy blood, male 1,062, female 1,060, Dr. Garrod found the specific gravity of cholera blood in males 1,076—1,081, in females 1,068—1,074—1,076; the blood globules increased from 140 to 166—171 in 1,000 parts. The density of the serum was greatly augmented; the fibrine changed in quality, so that it could scarcely be collected; the urea was in excess, especially during the reactionary stage. In one case the serum of the blood taken during life yielded 1·14 parts of urea in 1,000. It can scarcely be wondered at that with such a condition of blood as this, combined with the other causes I have named, the right side of the heart should be generally loaded, and the capillary vessels of the lungs nearly free from blood.

In eight specimens of blood that I have preserved and kept in stoppered bottles, there is no separation of the serum, the blood remaining of uniform consistence; of a deep claret-colour when shaken upon the glass. There is one peculiarity in cholera blood that I believe has not been before noticed. In all the recent specimens of blood that I have examined under the microscope, I have found the corpuscles, when in motion, more yielding and changeable in form than in blood taken from patients labouring under other diseases; and when at rest, before the corpuscle is dry, there is generally a central depression, although, after a short time, when the blood is dried on the glass, this is less apparent. Does this laxity of the corpuscle (as I believe) arise from the partial escape of its serous contents, and if so, will this account for some of the morbid appearances in Cholera? This is a matter that requires further investigation; but from the examination of the blood of man, and of a very large number of the lower animals, suffering from various diseases, I am enabled to speak with some degree of confidence upon this matter; and here let me very briefly allude to an interesting question respecting the cause of the coagulation of the blood, and of its tendency to stagnate in the vessels of the living body. I was a candidate for the Astley Cooper "Prize Essay on the Cause of the Coagulation of the Blood," obtained by my friend Dr. Richardson, in 1856. My essay was a very imperfect one, for I devoted too much time to the investigation of the size and formation of the blood-corpuscle of the lower animals, including the thickness of the parietes of the heart and large arteries, to allow of the prosecution of experiments that I intended to have made. During my microscopical examinations, I came to the conclusion, from repeated observation, that the escape of the fluid in the corpuscle by exosmosis played an important part in the coagulation of the blood; a conclusion, as far as I know, not before made. That the chief cause of the coagulation of the blood was the loss, or partial loss, of its vital or electric influence, and that the corpuscles became aggregated in consequence of the loss of their fluid contents. I believe I was the first, in my "Prize Essay on the Structure and Use of the Thyroid Gland," to protest against the correctness of Dr. Richardson's conclusion *that the loss of ammonia is the cause of the blood's coagulation*, believing that no such cause could exist within the vessels, and believing, also, that the blood begins to die as soon as it leaves the body, and that the escape of ammonia is a necessary consequence of such death. The papers of Mr. Lister, Mr. Gamgee, and others who have attempted to refute Dr. Richardson's conclusions, were published after my Essay was sent to Guy's Hospital. I hope to make this matter plainer on a future occasion, and to show that the state of the blood in Cholera has a material bearing upon this question.

TREATMENT.

When investigating such a mysterious and fatal malady as Cholera, it behoves one to speak with great modesty and diffidence, and to confess that we are now, as in 1832, utterly and entirely ignorant both of the cause and nature of this disease. We know that a subtle poison, which probably first exercises deleterious influence upon the nerves, pervades the system, and it may be is now in the blood of more than half the inhabitants of London. We know also that any depressing cause, such as fear, great bodily labour, vitiated air and water, improper diet, may so derange the atomic constituents of the vital fluid that a great proportion of the serous particles filter away, leaving the red corpuscles in excess, and thus the poison to a great extent destroys the heart's power, the blood remaining in many of the vessels still and stagnant; and hence, as I fully explained in 1849, the necessity of arresting the serous discharge at the onset, and maintaining the integrity of the blood. It is in the early stage that the benefit of medicine is positive and unmistakable, and probably in this stage in the great majority of cases there is no disease so amenable to treatment.

It is true in some instances, especially in hot climates, the patient is struck down without vomiting or purging; but these are exceptions to the general rule, and I have never seen a fatal case in this country where these symptoms have been absent; and it must be borne in mind that in many fatal cases the intestines are filled with a large amount of the serous portion of the blood. Dr. Macpherson, who has seen a large number of Cholera cases in India, in his recent work on "Cholera at Home" says, "I have never seen a case in which there has not been vomiting and purging." Dr. Hardie, Surgeon 73rd Regiment (*British Medical Journal*, August 25th, page 209), who has seen the disease in India as well as in two epidemics in the Mauritius, says he has never met with a ease of the so-called dry Cholera; and I believe that this statement will be confirmed by the majority of medical practitioners who have fully investigated the cases of malignant Cholera that have come under their notice. In all diseases we find occasionally strange deviations from the general type, and so in Cholera examples may occur of what is called dry Cholera (Cholera sicca), but these are rare and unfrequent.

Comparative Methods of Treatment.—As I have before said, much will depend upon the period of the epidemic, the locality, and probably on the mode of treatment, although in all localities this is varied enough, and we have had vaunted remedies of all kinds, and many that appeared to be successful when first tried, but have afterwards lost their reputed efficacy. Dr. Bushman, in his work on "Cholera and its Cure," 1850, gives the preference to the saline treatment, and of 446 cases, he says "only eight were fatal" under Dr. Stevens' plan (page 164), and yet so little confidence is placed in this treatment that it has scarcely been resorted to during the present epidemic. Under the calomel treatment and under various other methods of cure, or of reputed cure, I could quote examples of success equally startling. It is evident, that if the hospital establishment which I advocated in 1849 (page 9), had been formed by the Government in 1854, or during the present outbreak, and three of the most approved modes of treatment had been carefully and accurately tested, we should not be in our present state of doubt and uncertainty. As I said in 1849 no objection could fairly be made on the ground that the poor should not be the subjects of experiment, for at the present time, if we look to the Hospital Reports, all treatment is to a great extent experimental.

Irrespective of family ties, what medical man would object, if he had Cholera, to enter such an hospital? Instead of the niggardly sum of £500, employed by Mr. Simon (as reported in the medical journals), the amount required for the building of one iron-clad ship for the destruction of life would scarcely have been sufficient for the establishment of temporary experimental hospitals, and for the prosecution of scientific investigation of a *comprehensive* kind.

The treatment of Cholera may conveniently be divided into the external and internal, the former including the warm bath, hot-air and vapour baths, hot bricks, hot salt, blankets dipped in warm water with or without spirits of turpentine, ice to the spine, chloroform, counter irritants and rubefacients of various kinds, such as mustard, turpentine, ammonia, horseradish, galvanism, dry cupping, and exhaustion of the air from the surface of some parts of the body. Among the internal remedies are catechu, aromatic confection, diacetate of lead, kino, dilute sulphuric acid, ipecacuanha, common salt, saline salts, as sesquicarbonate of soda, chloride of soda, chlorate of potash, castor oil, calomel, bichloride of mercury, the mineral and the vegetable acids, preparations of arsenic, iron, copper, and zinc, sulphite of lime, bisulphuret of carbon, nitrous oxide, chloroform, chlorodyne, camphor, ether, oxide of silver, strychnine, quinine, chlorate of gold, bismuth, starch, various emetics, ammonia, tobacco, carbolic acid, permanganate of potash, elaterium, yeast, cannabine, tartarized antimony, oxygen gas, aloes, alum, sugar, charcoal, turpentine, Epsom salts, sulphur, rhubarb, asafœtida, black pepper, colchicum, Indian hemp, terchloride of carbon, salacine, creasote, Cayenne pepper, prussic acid, phosphorus.

In addition to these, various astringents and other medicines have been thrown up the rectum, blood and saline substances have been injected into the veins, solutions of morphia, quinine, and other compounds have been by the hypodermic method passed under the skin, and the rectum has been plugged to prevent the escape of serous fluid.

It must not be supposed that I have enumerated half the medicines and modes of treatment that have been tried in Cholera. I speak of those only I happen to remember, and I trust that I shall be forgiven by any of my readers who may suppose that I have omitted measures that they may think of greater importance than any I have enumerated.

Aperient or Eliminative Treatment.—I have already endeavoured to show that the theory upon which this treatment is based is unstable and visionary, for there is no proof whatever that spasms of the small arteries of the lungs take place in this or in any other disease, nor is there any proof that vomiting or purging are efforts of nature to get rid of the poison from the system. It would be as rational, I think, to infer that the sweating stage of ague is an effort of nature to rid the system of the malarious poison, and that it would, therefore, be improper to stop it by means of quinine.

Let me give the following examples, which have been witnessed by thousands of practitioners. Two persons have choleraic diarrhœa; the one takes the necessary precautions and the diarrhœa is at once stopped, and although the poison remains in his system, he is restored to health in two or three days; the other, as in the case mentioned at page 8, neglects the early treatment, goes on with his usual occupation, losing a large amount of serous fluid by the bowels, vomiting is soon present, the stage of collapse sets in, and all medical aid in too many instances is unavailing. This is not an overdrawn picture, but one of daily occurrence. It is not pretended that all cases of Cholera are so amenable to treatment in the first stage; unfortunately too many patients have succumbed when early assistance has been had recourse to, and no means have been neglected, as far as our present knowledge extends, to arrest the progress of the malady. It cannot be too often impressed upon the public that a diarrhœa that in ordinary times may be salutary, during the prevalence of Cholera, if neglected, leads to a fatal termination.

But let us come to a practical question, and ask what evidence we have as to the efficacy of the castor-oil or eliminative treatment, so called, in Cholera? Let us pause for a moment, and ask whether this treatment is really eliminative? I think most of my readers will infer with me that the term eliminative is a misnomer. If we wished to adopt an eliminative mode of treatment, Elaterium, Epsom salts, Glauber's salts, or some saline aperient that would increase the serous discharge from the bowels, would surely be more appropriate, and more in accordance with common sense. There are few persons who have not experienced the action of castor oil; and there are few, I believe, in the profession who will come to the conclusion that the poison of Cholera can be eliminated by castor oil, which removes only the contents of the alimentary tube. But again let us ask, what evidence have we of benefit that has accrued from this treatment? In Dr. Johnson's 54 cases of Cholera and diarrhœa treated at the King's College Hospital in 1854, only 14 deaths occurred; but many of these were examples of the first stage of Cholera, choleraic diarrhœa, and therefore more amenable to medicine. I could find examples where the success has been apparently much greater under various modes of treatment. But what evidence have we of the efficacy of this mode of treating the disease during the present epidemic? According to the reports of the *Lancet* and *Medical Times*, Aug. 11, Drs. Frazer and Davis, of the London Hospital, have tried it and abandoned it. Dr. Barlow, Physician to Guy's Hospital, in his excellent and practical articles on Cholera in the *Medical Times and Gazette* (Aug., 1866), neither favours Dr. Johnson's practice nor his pathology; nor do the vast majority of the members of the profession. I could quote numerous examples where the treatment has entirely failed; indeed, where all the patients who took the oil died; but this, it is fair to observe, will apply to any mode of procedure in the treatment of Cholera.

As I said in my preface, castor oil can do but little good or harm in the latter stages of the disease, and it may be more successful than many other medicines whose virtues have been equally lauded; but people are told, through the public press, to take castor oil in repeated doses in the early stage of Cholera, to eliminate the poison, instead of having recourse to astringents and opium—a doctrine, I believe, alike dangerous in practice and false in theory.

Calomel Treatment.—I now come to the vital and important question as to the best treatment to be adopted; and I now, as in 1849, give the preference to calomel. It may naturally be said, "But why administer calomel, and condemn the use of castor oil?—they are both aperients." But all who have had sufficient experience of the use of these medicines know that their action is very different; the one, calomel, often acting as a sedative by arresting the vomiting and assisting the passage of the bile into the intestines, whilst the other is too often an irritant as well as an aperient. Calomel, according to my experience, tends to diminish the gastric and alvine serous discharges, and does not act as an eliminative in the sense used by Dr. Johnson. Another great advantage in the calomel treatment is that the medicine is readily administered by placing it upon the tongue, whereas the castor oil is generally disagreeable to the patient; and many, to my knowledge, have positively refused to take it. But what is the calomel treatment? By this I mean the simple administration of a grain of calomel, with the same quantity of sugar, every fifteen minutes for a few hours; after which the dose can be diminished; or two grains of calomel every half-hour, without opium or stimulants of any kind. I have stated (p. 9) that in 1849 I treated twenty cases of Cholera; and that, with one exception, they were all seen with other practitioners. Of these only seven recovered, but several were nearly moribund, and in the great majority the calomel treatment was not fairly carried out; stimulants, opiates, salines, and other medicines having been given before it was commenced. I have but little faith in this treatment unless it be early adopted. Let me give an example or two of its efficacy (or supposed efficacy) when given at the onset of the attack of serous purging.

In 1848-49 I attended three members of our profession for Cholera, —Mr. Smales, then living at Walworth, the late Mr. Jos. Beane, of Peckham, and my brother, Mr. F. Crisp, of Walworth. All had cramps, cold skin, and serous vomiting and purging. I need only record the particulars of one case. Mr. Smales, after neglected diarrhœa for two or three days, was seized with serous vomiting and purging early in the morning when in bed (the most common period of attack). He had partial loss of voice, severe cramps of the legs and abdomen; the skin and tongue were cold, the eyes sunken, and the countenance much altered. I gave him a grain of calomel and a grain of sugar on his tongue every fifteen minutes, with a little ice and soda-water occasionally. After a few hours the vomiting, or, rather, the gulping up of fluid from the stomach, diminished; the diarrhœa became less frequent; the countenance and the pulse improved. The next day a bilious motion was passed, the secretion of urine returned, and the patient gradually recovered after taking about forty grains of calomel. The other cases were rather less severe, but the result of treatment was the same. I believe, in these examples, as in many others that might be adduced, it was the *early* administration of the calomel, without *injurious complications*, that favoured recovery. I would never administer astringents after the appearance of serous vomiting and purging, not because I believe that the vomiting and purging are the means of eliminating the poison, but because the calomel appears to me by its action on the mucous lining of the stomach and intestines to arrest the discharge of serous fluid, and to stop those actions that are called eliminative. To use a homely phrase, an astringent that may act as a plug in the bilious stage of diarrhœa has but little influence in checking the discharge at a later period, when the intestinal villi are rapidly losing their epithelial covering.

The reader must not suppose that I put much faith in calomel, or in any other medicine, in the latter stages of Cholera ; but in the early stage, although admitting its failure in a great many instances, I have more confidence in this medicine than in any other, not judging alone from my own experience, but from the testimony of the great bulk of those who have written upon the treatment of Cholera.

Two very contradictory objections have been urged against the use of calomel ; the one is that it is not absorbed, the other that it produces salivation. Who would not be glad to escape with a sore mouth from an attack of Cholera ? I may remark that calomel affected the gums only in one of the cases above mentioned. The statement so often made that the calomel remains on the coats of the stomach, and does not enter the system, I believe, is generally unfounded ; in two cases I have alluded to, what appeared to be calomel, proved on examination to be other matter. In the last stage of collapse, with a loaded and oppressed heart and a highly poisoned blood, neither calomel nor any other medicine can be of much service ; the time for calomel is at the onset of the serous purging and vomiting.

Best Means of Prevention.—I believe that no person in a Cholera district, whatever his occupation or station in life, is free from the liability to an attack of this disease. The statistics I have given abundantly show this. The best plan for all who can afford it is to leave the infected district and seek a pure atmosphere. For those who are compelled to remain, from conscientious or other motives, I believe the best precautions that can be taken are to keep to the diet and drink that they are accustomed to ; to avoid excesses of all kinds ; and especially to stop diarrhœa at the onset, by opium and astringent medicines ; to avoid so-called specifics ; and to send at once for their medical attendants, who are best acquainted with the peculiarities of constitution that may exist, and who can vary the treatment according to circumstances. For those who cannot *at once* procure medical advice, I recommend the following mixture, a fourth part to be taken every two or three hours, until the diarrhœa is relieved. One dose will generally suffice until medical aid is obtained.

℞ Tinct: Opii, ʒi.
Tinct: Catechu, ʒii.
Spts: Ammon: Aromat: ʒi.
Vini: Ipecac: ʒi.
Aquæ Cinnamomi, ℥vi. ft. Mistura.

Other means, such as three grains of diacetate of lead, with a quarter of a grain of opium, repeated every two or three hours, if necessary, may accomplish the same end. But above all things, as I said in 1849, stop the diarrhœa at once. Attention to drains, to water-closets, and to good ventilation in all parts of the house is highly necessary. The use of disinfectants, such as carbolic acid, permanganate of potash, chloride of lime, vinegar, burnt tar, and sulphur, may also be had recourse to.

During a cholera epidemic, as I said in 1849, I believe the making of large fires in infected districts, and the burning of tar, rosin, nitre, charcoal, and sulphur would have a good effect; and in all private houses I think it is a good plan two or three times daily to burn brown paper, with a small quantity of tar and sulphur. These measures may not altogether prevent attacks of cholera, but I believe that they would diminish their number. Boiling the water that is drank is a matter of special importance; and in addition to this, filtration through animal charcoal may be resorted to.

Hereafter it is to be hoped that the water of London, and that of all our large towns, will be obtained from a greater distance than at present. The Thames, although comparatively pure, contains abominations of all kinds; and so with the greater number of rivers supplying large cities.

The necessity of disinfecting and of properly disposing of all cholera evacuations is most important, and it is better, where it can be done, to have a hole dug in a suitable locality, and cover them with a layer of earth. Sulphate of iron should also be mixed with them. I need scarcely say that cleanliness on the part of all nurses should be strictly enforced, and all bedding, clothes, and linen should be destroyed or carefully disinfected.

Dr. Jules Worms, in an able pamphlet on "The Diffusion of Cholera," Paris, 1865 (p. 43), says, "Cholera patients were admitted at the Military Hospital of Gros Caillou, during six weeks. All the dejections were received into closed vessels, and mixed with sulphate of iron, and all the linen plunged into a solution of chloride of lime. Since this, not a single case has appeared among the wards occupied by the other patients, although they are only 30 metres from the special service wards, and no medical officer has been attacked."

In closing this chapter on the prevention of Cholera, I cannot help alluding to a remarkable circumstance mentioned by Dr. Hardie, whose paper I have before referred to. During the outbreak of Cholera at the Mauritius, June, 1854, 1,800 Chinamen were in the midst of the disease, and of these only two died. Did the use of opium and tea occasion this immunity? I think it more than probable that this is the correct explanation.

Before I conclude this chapter on treatment I cannot help commenting upon the widely-circulated directions given by the Cholera Committee of the Royal College of Physicians, at the solicitation of the Privy Council, to captains of ships, and to the public generally, for the treatment of Cholera. Of all things commend me to a conclave of doctors! The greater the number, I believe, the greater the danger to the patient. All have their pet crotchets, and the result is that instead of plain common-sense directions, the whims and caprices of all must be consulted, and too often a namby-pamby, half-and-half treatment is adopted. The President's and Dr. Johnson's (so-called) eliminative medicine must have its due influence, so castor-oil may be given at the onset, if "bad or obviously indigestible food has been taken, or if the discharges are unnaturally offensive." Fancy the captain of a ship attending to offensive discharges or obviously indigestible food. Better invoke the aid of Neptune.

Let me give, at the risk of again being charged with presumption in differing from such learned authorities, the treatment I have recently adopted in my own case when suffering from diarrhœa. On the 7th of August I saw a large number of Cholera cases at the London Hospital, through the kindness of Dr. Andrew Clarke. I also spent some time in the dead-house, as well as in the examination of the blood and excreta under the microscope; added to this, my diet at supper was not of the most orthodox kind. In the night I was attacked with diarrhœa, and in a short time I took catechu, chalk, a grain and a half of opium, with some ipecacuanha, and I was well in a few hours. I do not assert that I had Cholera, but I think no person can be long in Cholera wards and over dead bodies without imbibing some of the poison. Let no one with diarrhœa in Cholera times trust to five-drop doses of laudanum, or to ten grains of aromatic powder of chalk and opium.

In too many cases patients, when seen at the earliest stage, will die under every mode of treatment, but I believe the best plan is to stop the purging at the onset with a *sensible* dose of opium, combined with some astringent.

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GENERAL CONCLUSIONS.

Conclusions.—1. That cholera is a disease occasioned by a specific poison that affects first the nervous centres, paralyzes the heart and the most important organs of secretion, the liver and the kidneys; disorganizes the intestinal secretory apparatus, disintegrates the blood, thereby allowing a large portion of its serous constituents to escape from the system.

2. That the assertion that the anæmic condition of the lungs, and the consequent sinking in Cholera, depends upon spasm of the pulmonary arteries, is not founded upon correct physiological inference nor upon pathological proof.

3. That the belief that the vomiting and purging are efforts of nature to get rid of the morbific matter from the system has little or no real foundation, and that the *general* adoption of the so-called eliminative or aperient treatment in the early stage of Cholera is likely to lead to injurious results.

4. That, judging from the occupations of 5,566 males dying in London in 1849, 1853, 1854, and 1866 over 20 years of age (some of them engaged in the most dirty and filthy employments), occupation alone exercises but little influence in the production of the malady.

5. That there is every reason to believe that under certain circumstances Cholera is a communicable disease, but to a much less extent than small-pox, scarlatina, and other zymotic affections.

6. That bad water, improper food, a vitiated atmosphere, want of cleanliness, intemperate habits, fear, the incautious use of aperient medicines, and other depressing agents, all act as predisposing and exciting causes of the disease.

7. That the general belief that Cholera is a disease confined especially to the poor and destitute is entirely disproved by the statistics that I have adduced.

8. That the great majority of Cholera cases, when seen at the onset in the first stage of choleraic diarrhœa, are for the most part readily under the control of opium, combined with astringent medicines.

9. That, judging from our present knowledge, the calomel treatment when commenced early in the second stage of Cholera and properly carried out offers the best chance of cure, but that, like every other medicine, in many cases it appears to have no salutary effect.

10. That, as shown by my experiments, Cholera evacuations produce no injurious effect upon fishes, reptiles, birds, and quadrupeds ; and that, from the evidence I have adduced, the lower animals and the members of the vegetable kingdom during Cholera epidemics in this country have been as healthy as usual.

COMMENTS ON THE PUBLIC HEALTH ACT.

Public Health Act. It will not be out of place at the present time to say a few words on the Public Health Act, August, 1866, especially as regards the conveyance in public vehicles of persons labouring under infectious diseases. I was the first in the *London Medical Examiner*, January, 1851, to bring this matter before the medical profession. No other medical journal had treated upon the subject. I copy the article to show that after fifteen years my suggestion has been but very imperfectly carried out.

ON THE PUBLIC CONVEYANCES OF LONDON.*

More than twenty years ago, we were in the habit of riding frequently in the Paris omnibus, a nice, roomy, well-ventilated vehicle, with plenty of room for knees and elbows, where a duchess might sit at her ease, and the asthmatic patient breathe with the same freedom as in his own chamber. The conductors well dressed and civil; the coachman going a steady pace, but though rather tortoise-like, he reached his destination without *loitering on the road;* he gave his passengers time to get fairly seated before he started, and did not endanger their lives and limbs by jolting them off the steps at their departure. Drunken people, bundles of linen, sheep's heads, baskets of fish, and other offensive articles, were not permitted to annoy the eyes and noses of the travellers, and dirty straw did not encircle their feet. Moreover, for threepence a person could be put down in any quarter of Paris. The above description will apply to the present mode of travelling in Paris, as well as to that of 1829. At the latter period there was not an omnibus in London. But why are our vehicles so badly regulated? Simply because government takes no concern about the matter, so long as it gets the *duty;* like the sale of quack medicines, the *money* is the *object;* the public welfare is a secondary consideration. But what has this question to do with a Medical Journal, it will be asked? We have introduced the subject, because we believe it is one that materially concerns the *public health.* It is nothing to us if people wish to be squeezed and wedged together like the oxen at Smithfield; this and other matters we could name, do not come within our province, but if we can show that many persons lose their lives, by the bad arrangement of our public conveyances in London, our time will not have been unprofitably occupied. We need not inform medical readers that a certain number of people require a given quantity of pure air, for proper respiration, and that, according to the present size and ventilation of the London omnibus, they cannot obtain this. That if a person predisposed to illness breathe such an atmosphere—as he is frequently subjected to—in one of these carriages, he must soon be on a sick bed. That an individual, during the prevalence of Cholera, or any other epidemic, when the tendency to disease, and the preservative powers of nature, are nicely balanced, need only get into an omnibus to turn the scale. If rheumatism should be his bane, he may obtain draughts without a doctor's prescription; or he may inhale the vapours from bundles of dirty linen, reeking from the bed of contagion.

Let us now turn to another evil respecting the public health, that has been entirely overlooked. At the commencement of the present year, we attended a very beautiful woman, who fell a victim to that former scourge of the human race, small-pox. A few days before the eruption appeared, she was on board a steamboat at Southampton. The man who gave the cheques, had his skin covered with small-pox pustules. This lady believed she had taken the disease, before it appeared, and thought that it would prove fatal. But who can get into a hired vehicle of any kind in London, and feel sure that the lining is not saturated with the miasms of small-pox, scarlatina, or typhus?

We see no chance of redress for these evils, until we have a Board of Health properly constituted, and a government that thinks more of the public good, than of *public* pensions. There is no reason why the conveyances of London should not be as comfortable and as salubrious as those of Paris. We would have vehicles in various districts for the express purpose of carrying those affected with contagious diseases; and we would inflict a severe penalty upon those who, by infringing this law, endangered the health of the community.

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* From the *London Medical Examiner*, 1851, vol. i., p. 243.

Let me now ask how this Act will remove the danger of which I complained in 1851. I copy clauses 24, 25, 38 :—

24. It shall be lawful at all times for the nuisance authority to provide and maintain a carriage or carriages, suitable for the conveyance of persons suffering under any contagious or infectious disease, and to pay the expense of conveying any person therein to an hospital or place for the reception of the sick, or to his own home.

25. If any person suffering from any dangerous or infectious disorder shall enter any public conveyance without previously notifying to the owner or driver thereof that he is so suffering, he shall on conviction thereof before any justice be liable to a penalty not exceeding five pounds, and shall also be ordered by such justice to pay to such owner and driver all the losses and expenses they may suffer in carrying into effect the provisions of this Act, and no owner or driver of any public conveyance shall be required to convey any person so suffering until they shall have been first paid a sum sufficient to cover all such losses and expenses.

38. Any person suffering from any dangerous infectious disorder, who wilfully exposes himself without proper precaution against spreading the same disorder in any street, public place, or public conveyance, and any person in charge of one so suffering, who so exposes the sufferer, and any owner or driver of a public conveyance who does not immediately provide for the disinfection of his conveyance after it has with the knowledge of such owner or driver conveyed any such sufferer, and any person who without previous disinfection gives, lends, sells, transmits, or exposes any bedding, clothing, rags, or other things which have been exposed to infection from such disorders, shall, on conviction of such offence before any justice, be liable to a penalty not exceeding five pounds, provided that no proceedings under this section shall be taken against persons transmitting with proper precautions any such bedding, clothing, rags, or other things for the purpose of having the same disinfected.

As I interpret the Act, nuisance authorities may provide these vehicles; but it is not compulsory, as it ought to be, for every Metropolitan vestry, or two or three vestries, to have such a vehicle in readiness, for which those using it should pay; and clauses 24 and 25 are so easily evaded that it will be almost impossible for a magistrate to convict under them, and the same remark will apply to clause 38.

Arrangements can easily be made with cabmen; and all who carry infectious bundles of linen in omnibuses will continue to do so with impunity. It is a difficult matter for the law to reach.

The only remedy, I believe, will be to have proper vehicles for the purpose, thoroughly disinfected, so that people may have no excuse for evading the Act; and railway authorities should be compelled to have a carriage to be used only by those who are affected with contagious diseases. Adults and children recovering from small-pox, scarlatina, and measles, are constantly removed in first-class carriages, leaving the fomites on the cloth for the benefit of the next occupant. There is less danger in second or third-class carriages. But a matter of greater importance is the establishment by the Government of two Metropolitan Hospitals on a large scale, the one for small-pox and the other for fever, so that poor people are not subjected to the formalities, delays, and expenses that they are put to at present. This is a national question, and it is not one that should be left to private charity. Small-pox has been fearfully prevalent of late, and I need not say that the delay and difficulty often experienced in getting patients to the small-pox hospital is often the means of spreading the disease. When shall we have anything national in this country? The very ducks before the Queen's palace in St. James's Park belong to a private company, although they are considered to be Royal ducks by the public. What slow steps will be made in advance during the *next* sixteen years?

The Act contains some good clauses; but I fear, as regards the enactments I have named, that they will be nearly inoperative.

ADDENDUM.

Since these pages were in print I learn that a *full* account of the Cholera cases at the London Hospital will appear in the forthcoming Hospital Reports. I am sure, from the great assiduity and zeal of all engaged in this inquiry, that this report will well repay perusal. In my letter on "Cattle Plague as Compared with Cholera and other Human Maladies," I shall have occasion again to speak of this pestilence.

APPENDIX.

On the origin, cause, pathology, treatment, and best mode of prevention of Cattle Plague—A comparison between Cattle Plague, Cholera, and other human maladies — A Letter on the treatment of the diseases of man and brute by Homœopathy, with an exposé of the false inferences and hollow assumptions of this pretended science, and on the present state of the Veterinary and Medical professions.

PREFACE.

THE first eleven letters were sent to the Lords of the Privy Council, and I publish them *verbatim*,* because I am anxious that they should form *a record of the outbreak of Rinderpest in this country, and of the tardy and inefficient steps taken by those in authority to stamp out the pestilence at an early period.* The letters were sent in manuscript to the Lords of the Privy Council, and then forwarded to the *Mark Lane Express*, where they were published, my object being to circulate my opinions amongst the agricultural community. In addition to this I had slips struck off, and these were forwarded to the London daily press, and to many of the Provincial newspapers. I now purpose, in addition to other matter, to add my comments to each letter, as the communications were for the most part hastily written. By this means I hope to make the essay more valuable than it would have been, had it appeared at an earlier period.

It was my intention to have published a larger treatise, with numerous coloured drawings that I have made, many of which were exhibited at the Pathological Society of London; but the advent of Cholera, and a belief that a comparison of the two diseases may be profitably instituted, have induced me to alter my plan, and to publish without farther delay.

A man who "sounds his own trumpet," does not generally gain the good opinion of his readers, but at the risk of being charged with presumption I state some of the results of my investigations.

1. I was the first to show, by experiments made upon myself and

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* Some few additions were occasionally made to the manuscript letters to the Privy Council.

upon the lower animals, that the flesh of cows or oxen dying of the Cattle Plague in its first stage was not injurious to man when used for food. (Letter 2, September 30th.)

2. That the poison of Cattle Plague, when introduced into the human system by means of inoculation, occasioned no injurious effects, with the exception of papular eruptions on the skin, and that the reported deaths from supposed Cattle Plague inoculation arose from splenic apoplexy. (Letter 2, September 30th.)

3. That the disease was a malignant spotted fever (febris maligna guttata), and had little or no resemblance to typhus or typhoid fever in man, and that the ulceration of the stomach and intestines, spoken of by the Government advisers and others, but rarely existed. (Letter 2, October 31st.)

4. That the disease not only affected sheep and goats, as shown in my fourth letter (p. 66), but that I knew of six different species of ruminants that had died of it.

5. That an hospital should be formed by the Government in a suitable locality, with a staff of competent officers. (Letter 1, September 21st, 1865.)

6. That experiments should be made by the Government on a *large scale*, irrespective of cost, at the suggested hospital; and the prophylactic powers of small-pock matter, and that of scarlet fever, measles, typhus, and typhoid fever virus by inoculation, should be tested, as well as the virtues of various medicines as prophylactics or otherwise. (Letter 2, September 30th.)

7. That all fairs and markets should be suspended, the movements of sheep and cattle by rail or road should be stopped, that dead meat markets should be established, and that all foreign animals should be killed at the ports of landing, that all dogs should be shut or tied up, and all hunting prevented. (Letter 1, September 21st.)

8. That an animal may be affected with this plague in an incipient form so that no inspector can detect its presence, and that in this manner the plague has been disseminated in all directions to a fearful extent. (Letter 3, October 7th.)

9. That the Cattle Plague has been extended by means of hounds and hunting. (Letters 7 and 10, December 20th.)

10. That the theory as to the identity of small-pox and Cattle Plague is not founded on correct evidence. (Letter 8, January 4th.)

It will naturally be asked by some of my readers whether, if I had obtained a government appointment, my strictures upon the proceedings of the Privy Council would have been equally severe. My answer is that the views I have enunciated respecting the state of our medical and scientific institutions have been long publicly expressed, and I think this a good opportunity of repeating them. Red-tapeism would probably have had some soporific influence upon myself, as it appears to have had on all who have been encircled by it.

All new matter is in a larger print. The chapters relating to treatment, future prevention, and the comparison between Cattle Plague, Cholera, and the diseases of man and the lower animals, have not been before published, nor has the letter on the homœopathic treatment of Cattle Plague and other diseases, nor that on the state of the medical profession. I have pursued this investigation, as I have all my inquiries respecting the diseases of the lower animals and of plants, under the belief that I shall be able to throw much light hereafter on human pathology and treatment. The only proper method of studying the structure of organized beings is to begin with the lowest forms and work upwards to man: so I believe in the disorders and derangements of these structures, Nature's secrets are best revealed in the lowest grades of organization; and I predict that hereafter—the period it is impossible to calculate—all students will study morbid derangement, as they now do, or should do, anatomy and physiology, by adopting the ascending scale. If my life be spared a short time, I hope to be the pioneer of this new method of investigating disease.

APPENDIX.

LETTER I.—ON THE STOPPAGE OF THE MOVEMENTS OF CATTLE, AND ON THE ESTABLISHMENT OF DEAD-MEAT MARKETS.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—When the Cattle Plague first made its appearance in this country, I placed before the Clerk in Waiting various documents, to show that I had for many years been investigating the diseases of the lower animals and of plants, for the purpose of throwing light upon human pathology and treatment, believing that in the study of disease the same system should be pursued as in the study of organized beings—viz., the ascent from the lowest to the highest, a mode of investigation which, I believe, is exclusively my own. Among the publications forwarded were my prize essay* on "Lamb Disease" (awarded by Lord Portman); my essay on the "Causes of Death of the Animals dying at the Regent's Park Gardens, from 1851 to 1862;" my essay on "Splenic Apoplexy in the Ox, Sheep, and Horse" (a disease that kills sooner than the Cattle Plague), and a numerous list of my papers and morbid specimens of diseases of the lower animals, exhibited at the Pathological Society of London. I have, moreover, made the largest collection of the diseases of the lower animals yet formed (many of them in wax). I offered my services to the Government, to investigate the cattle murrain in this or in any other country; and I presume to think, my Lords, that, if my offer had been accepted, I could ere this have placed before the Government and the people such a history of the origin, cause, extension, mode of prevention, &c., of this disease as would have been of service to the country and to the cause of science.

In answer to my letter to Sir G. Grey, I am informed by Mr. Waddington "that the appointment of inspectors is made by the Privy Council." Believing that my long and unrequited labours in the cause of science entitle me to a better and more useful post than that of a cattle inspector, I shall, in proof of this, take the liberty of placing before your Lordships, from time to time, certain facts connected with this disease that will, I hope, throw some light upon the subject. The inquiry is one of national importance; and I can, therefore, well afford to incur any charge of presumption and vanity that may be brought against me.

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* None of these are sold for my own benefit, or I should not have noticed them.

Let me first place before your Lordships the line of investigation that I have chalked out in studying this disease; and then, without following the programme, I will in this and other papers touch upon a few points that I consider of immediate and pressing importance.

1. A brief history of epidemic and endemic diseases in man, in the lower animals, and in the vegetable kingdom.

2. The history of the Cattle Plague in this and in other countries; its variation and abatement, according to season, locality, and the precautionary measures adopted.

3. The origin and cause of the disease in this country, the localities in which it has appeared in the United Kingdom, with statistics of age and sex, the number of animals affected, and the amount of mortality.

4. The symptoms, duration of the disease, and its morbid appearances, especially in relation to the microscopical and chemical condition of the blood.

5. Is the milk or flesh of animals affected with this disease injurious to human beings when taken as food?

6. What resemblance does the disease bear, in the symptoms and morbid appearances, to the typhus or typhoid fever in the human subject?

7. Is the disease now prevailing the rinderpest of Prussia?

8. On the parasitic origin of the disease.

9. The normal visceral anatomy of the ox, sheep, and other ruminants, with a view to ascertain the peculiarities in the structure of the bovine family that especially render them liable to be affected by this mysterious poison.

10. The most practical and efficacious means of prevention, especially as regards the prophylactic treatment by the internal administration of medicine and the distribution of gases through the atmosphere.

11. An estimate of the success attending the various modes of treatment, with suggestions as to the best methods to be pursued.

12. The best and most practical modes of disinfection, and an investigation as to the efficacy of chloride of lime, and other agents as disinfectants.

13. On the importation of foreign cattle as a means of engendering the disease, with practical suggestions for the better regulation of this import in future; and on the necessity of restrictions in the conveyance of cattle by rail.

14. A general summary of the above, with practical conclusions for the guidance of the Government, of agriculturists, cow-keepers, and stock-dealers.

As I said before, my Lords, it is not my intention to trouble you with the series of investigations enumerated above, but rather to place before you, from time to time, such selections from my labours in this field of research as I believe will be practical and useful. A great difficulty presents itself at the onset in the proper investigation of this disease, in consequence of there being no scientific central authority in this country, to which the Government can refer in a calamity like the present; and the same remark will apply to the medical profession. We have in the one profession* twenty licensing bodies, all requiring different *curricula* and different examinations; and in the other a college granting a degree, but one which is not compulsory; so that nine-tenths of the veterinary practitioners of this country have had no proper education or examination! Again: let us look to agriculture, where, instead of an agricultural university and museum (the establishment of which I have long publicly advocated), where a good education might be obtained, degrees granted, and professors paid by the State, some of whom might be consulted in such an emergency as the present, we have another club (of which I am a member) in the shape of the Royal Agricultural Society, who eke out education by driblets at their model establishment at Cirencester. My Lords, all is clubism in this country, and there is nothing national or universal about any one of our scientific institutions. But let me suppose, my Lords, for the sake of exemplification, that when this "Cattle Plague" first made its appearance, we had had in this country a representative Faculty of Medicine in England, Ireland, and Scotland; a veterinary college in each of the three kingdoms, the examination at which all who (as in France) act as veterinarians would be compelled to pass; and an agricultural university, in which the study of the lower animals would form an important item in the *curriculum;* and that selected from these faculties or colleges a commission had been formed to investigate this disease, and to report upon it; is it likely, my Lords, that many important matters would be in the same state of doubt and uncertainty as at present? Let me explain. In the lengthy document by Dr. Thudicum (approved of by the Privy Council), constant reference is made to the use of chloride of lime—"A healthy animal is to be washed with chloride of lime, with tepid water; then fodder, both dry and green, is to be given; then sop and pure cold water; and next, the animal is to be rubbed dry with wisps of straw and hay." My Lords, there is no proof whatever that chloride of lime will prevent the noxious effects of this poison when received by the lungs, its ordinary and perhaps sole mode of access; but assuming that the poison may be introduced by the skin, I can conceive no method so likely as this washing, wetting, and rubbing to effect the introduction of the poison; and as to "pure water," everybody connected with cattle knows that these animals give the preference to, and do better upon, the water of ponds and ditches, which is so impure that it would be considered unfit for human beings. The occurrence of this disease is not a question of *health.* A diseased animal would probably be more likely to escape the malady which the strongest and healthiest readily succumb to. As I shall have occasion to allude to this curious document hereafter, I will for the present confine myself to the chloride of lime question—viz., Has this substance the disinfecting influence imputed to it? How are we to determine this? My Lords, if the imaginary commission I have spoken of had been formed, a large sanitarium or hospital would have been established in an open space near London, where experiments might have been made to determine this and fifty other matters that are now in doubt and uncertainty. Experiments to be useful must be performed on a large scale; few and isolated experiments only lead to false inferences. To such an establishment formed by the Government, diseased animals, in closed vehicles constructed for the purpose, might have been taken; cows and oxen of little value might have been surrounded with chloride of lime, and introduced among the diseased animals; others that had had their systems saturated with sulphur, tar, salt, and many other substances, might have been similarly tested; and medical and other modes of treatment might have been tried; and in this way, as I believe, a vast number of important facts would have been elicited. On the score of cruelty, some would object to these experiments; but they (the experiments) would be "cruel kind," as the Irish say, as the sacrifice of the lives of a few cattle might be the means of saving a large number, and the extension of the malady by such a method as I advocate would not, I believe, be likely to occur.

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* See my evidence before the Parliamentary Committee on the Pharmacy Bill, Blue Book, 1852, pp. 156—165.

Before concluding this my first letter, let me, my Lords, urge upon you the necessity of *at once* placing restrictions upon the conveyance of living cattle by railroads; it is by this means that the disease has been quietly disseminated and conveyed to almost every part of England; and I think that the transport of all living cows, bulls, oxen, and calves should be at once prevented, and all large gatherings of cattle at fairs and agricultural shows prohibited.

Dead-meat markets should be established in various parts of London, and in all our large cities and towns; and the flesh only of oxen, cows, and calves should be admitted, when properly dressed, and inspected by competent persons. I am aware that such a prohibition would excite a great deal of opposition and discontent in certain quarters; but the necessity of taking stringent and active measures for preventing the spread of this disease is so urgent that all should be willing to make sacrifices for the general good. All foreign cattle (like our home-bred beasts), for the present, should be slaughtered out of London, and the flesh sent to the dead-meat market, after proper inspection; and so at all our seaports where foreign oxen are landed.

I have the honour to be, my Lord,
Yours respectfully,
EDWARDS CRISP, M.D.

42, *Beaufort Street, Chelsea, Sept.* 21, 1865.

Remarks.—Circumstances occurred that obliged me to deviate somewhat from the plan of investigation I had chalked out. The state of our medical and scientific institutions in connection with the progress of Cattle Plague I shall speak of hereafter.

LETTER II.—EXPERIMENTAL GOVERNMENT HOSPITAL.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—I learn from the Clerk in Waiting, Mr. Helps, that my letter published in the *Mark Lane Express*, September 25, was placed in the hands of Professor Simonds; but, my Lords, as I have informed Mr. Helps, these letters are intended for your Lordships' perusal, and not for that of Professor Simonds, for whom I scarcely need say I entertain no unfriendly feeling, and you will pardon me, I hope, for repeating what I stated in my first letter, where I offered to investigate this disease.

I trust that the special researches respecting the diseases of the lower animals, which have so long occupied my time and attention, will be a sufficient excuse for the present application, and that it will not be inferred that I am desirous of infringing upon the province of the veterinary profession.

Before entering upon the question of *prophylactic* treatment, and of the best means of testing this treatment, let me observe that, as far as my researches have gone, I do not find the same resemblance, either in the symptoms or morbid appearances, to the so-called typhus and typhoid fevers, that many have insisted upon; but this is a question that I shall have to bring more fully before your notice hereafter.

Let us now, my Lords, consider the important and vital question of *prophylactic*, or preventive treatment; for, by this method chiefly, combined with the precautionary measures recommended in my first letter, I believe, we are likely to stay the progress of the pestilence; and I may here remark, that although I am an advocate for a large experimental hospital in the first instance, in the neighbourhood of London, I see many objections to the establishment of numerous *sanitaria* in cities and towns; for I believe, if such hospitals were numerous, the plague would be greatly extended, and from the inadequacy of the funds at the disposal of private persons no experiments could be performed of a sufficient magnitude to lead to satisfactory results. The failure of the City Sanitarium, partly patronized by your Lordships, and the return of the money to the subscribers, are surely sufficient to show that such undertakings are not likely to succeed in the hands of private individuals. The £1,500 subscribed would scarcely be sufficient to supply the closed vehicles that would be required for the conveyance of the diseased animals. My Lords, to carry out this scheme effectually £100,000 at least would be required; a very small sum when the magnitude of the evil is considered and when the probable good that might accrue from the undertaking is contemplated. There is one objection that may be brought against the establishment of this experimental hospital, viz., "that it may become, by the accumulation of a large number of diseased animals, a focus of contagion;" but I believe if proper precautions were taken no such evil would result, but on the contrary, diseased and dead animals that are now driven about the streets, and their bodies exposed in open carts, would here be less likely, by their greater seclusion and the proper disposal of their bodies after death, to be the means of disseminating the disease. It must not be supposed that I advocate the attempt to treat the generality of animals affected with this disease; I believe, *according to the present state of our knowledge*, as suggested by the advisers of the Government, the best plan is to kill a diseased animal at once, and by this means endeavour to prevent the extension of the plague. But where is this killing and slaying to end? Are we to rest satisfied with our present knowledge, or rather ignorance, of the nature of the disease and its treatment? A remedy has been found for small-pox; and Asiatic cholera (a disease now in our midst) is, in its *first stage*, I believe, more amenable to treatment than many others. Why may not a remedy be found for the "Cattle Plague"? Why should we sit with our hands folded, and say, "The disease is incurable; doctors know nothing about it, and the animal *must* die." Let certain modes of treatment, my Lords, be fairly tested before we arrive at so unsatisfactory and so unphilosophical a conclusion; and let us not suppose, because the disease has hitherto baffled our efforts, that a remedy may not yet be found. Have we tried the right method of searching out Nature's secrets and of unveiling one of her hidden mysteries? Have we endeavoured to trace the *incipient* and *early* effects of this subtle poison?

Let me now, my Lords, briefly sketch an outline of the mode of investigation I recommend to the Government: many modifications and improvements may be made by others.

A space of five acres on Wandsworth-common, or in any suitable locality near London, should be covered with temporary wooden buildings, for the reception of 300 or 400 cattle, especial care being taken that the floors where the cattle are placed are of brick or asphalte, and that suitable means be taken to ensure good drainage—that large pits be dug for the reception of dead animals, and a good supply of fuel, quicklime, and of various substances for the fumigation of the atmosphere, be provided.

Attached to this hospital should be a commission composed of a good analytical chemist, a good pathological microscopist, four or six veterinary practitioners, and two medical men, who would at once make a series of experiments and investigations respecting the progress of the morbid changes in this disease, as shown by chemical analyses of the various organs and their secretions—by the changes of structure as indicated by the microscope, and especially by the investigation of the effect of certain medical treatment, external and internal, upon diseased and upon healthy animals, with the view to test the efficacy of supposed prophylactic or preventive measures. The introduction of two members of the medical profession to this commission would scarcely be objected to, I think, by the veterinarians; as, without any disparagement to the latter, it is well known that members of the former profession have been more minute in their investigations of disease than the practitioners of the veterinary art.

If such a commission were formed, the members would need no guide to direct them as to the line of experiment to be pursued; but no harm will result from my giving a short outline of my own plan.

First, as to the efficacy of chloride of lime. In addition to the test suggested in my last letter, six healthy oxen might be inoculated with ten parts of the secretion from the mouth of a diseased animal, mixed with one or more parts of chloride of lime. Many experiments of various kinds might be made with other disinfectants, or supposed disinfectants, to test their efficacy. It is worthy of remark that in the directions put forth by the Royal Agricultural Society of England, chloride of lime is not mentioned.

Healthy animals, that had been for some time under the influence of quinine, iron, sulphur, tar, salt, vegetable and mineral acids, mercury, antimony, arsenic, hellebore, and other agents, might be introduced among the diseased cattle, and in this way the virtue of certain substances now of doubtful repute be thoroughly tested, and the important question answered, as to whether by any mode of treatment we can so alter the blood of an animal as to render it unsusceptible to the effects of this poison? The efficacy of quinine as a prophylactic might be especially tested by giving animals from 40 to 60 grains twice daily for a fortnight, and then introducing them among diseased cattle. It is not pretended that such an expensive medicine could be generally employed; but, my Lords, we have a great number of animals in this country, worth hundreds and thousands of pounds, animals upon which the continuance of the present superiority of English stock depends, and in the treatment of these no expense should be spared. The question is not only one that concerns the food and health of the people, but it is one that especially affects us as breeders of cattle; for if measures of a more stringent and active character are not taken by the Government, many of our most valuable stock will be lost. Although, as I have said before, I do not see so great an analogy between this disease and typhus or typhoid fever as is generally supposed, yet I should in the present state of our knowledge place more confidence in the administration of quinine as a prophylactic than in any other medicine, and I would advise all stock-keepers who have very valuable animals to put them at once under this treatment. We have abundant evidence of the efficacy of quinine in preventing fever in the malarious and poisonous districts of Africa and other countries. A gentleman, who in one of the Nile expeditions was the only one to escape fever, told me "that he attributed his exemption to the circumstance of his having taken five grains of quinine twice daily for several months."

Let me, in conclusion, my Lords, mention a few medicines, the efficacy of which may be fairly tested at this experimental hospital, in the treatment of diseased animals. First, let twenty diseased animals be left entirely to nature; let the same number be treated with stimulants, and let twenty be subjected to the saline treatment without alcohol; the same or a greater number might be treated with turpentine, nitrate of silver, decoction of oak-bark, the vegetable or mineral acids, alum, bismuth, sulphur, sulphate of copper and opium, sulphate of zinc, acetate of lead, sulphate of iron, pepper, catechu, and many other medicines, alone or in combination.

Again, the effect of the injection of certain substances into the veins, and the transfusion of two or three quarts of healthy blood into the veins, should be tried; and if found of any efficacy, it could be employed in the treatment of valuable animals.

To many the purport of my letter is already sufficiently Quixotic; but there is one matter that I cannot refrain from mentioning, viz., the effect of inoculation (under guarded circumstances) of the virus of cow-pock, typhus, measles, and scarlatina from the human subject, as prophylactics or as remedial measures. It is surely worthy of trial. One of the direct scourges of humanity has been kept in abeyance by the introduction of vaccine matter from the cow into the human body.

These, my Lords, and many other matters crowd upon the mind in investigating this all-important and vital question. We are now in the fourth month of the disease. The members of Lord Stanley's model parliament are taking their ease, and are not to be disturbed; a Royal Commission, composed of men learned in comparative anatomy and in brute pathology, is "looming in the distance;" and when thousands more of cattle, and perhaps of sheep, have fallen victims to the disease we shall have their report.

In my next letter, my Lords, I will touch upon the peculiarities of the structure of the ox, sheep, and other ruminants in relation to this disease.

I have the honour to be, my Lords,
Yours respectfully,
Edwards Crisp, M.D.

42, *Beaufort Street, Chelsea, Sept.* 30*th.*

Remarks.—If this hospital had been established, as I suggested, the country, I believe, might have been saved a vast amount of money. Experiments were afterwards tried on a small scale by those appointed by the Government in populous metropolitan districts, and the dead animals often removed to the knackers in open carts, and the manure from these and other places was scattered broadcast throughout the country. I mention these matters to show that, irrespective of the good that would have accrued from the establishment of this hospital, the danger of contagion would have been considerably lessened. If the experiments that I suggested had been made, the waste of time and the increased extension of the disease by vaccination and other means would not have occurred. In the letter to the Lords of the Privy Council vaccination was suggested, but in the published letter it was accidentally omitted. It must be remembered that at this period the disease was generally treated, and was believed by the great majority of persons to be curable.

LETTER III.—THE STRUCTURE OF RUMINANTS AND THE LENGTH OF THE ALIMENTARY CANAL.

TO THE RIGHT HONOURABLE THE LORDS OF THE PRIVY COUNCIL.

My Lords,—Although the subject of my letter is on the structure of the ox, sheep, and other ruminants in relation to the Cattle Plague, circumstances have occurred since my last communication that are fraught with so much practical importance to the grazier and to the consumer, that I trust that I shall be excused for introducing them. During the last week I have examined the body of a cow, that animal presenting scarcely any signs of indisposition : she was passed at the first examination, but a few hours after this the practised eye of the inspector detected indications of the disease, and he ordered her to be slaughtered. I carefully cut through the whole length of the alimentary tube, and I examined all the other viscera, including the brain ; and although scarcely any symptoms were present during life, many organs exhibited unmistakable evidence of this peculiar disease. The first and second stomachs (paunch and honeycomb), as usual, presented to the naked eye internally a healthy appearance, the epithelial covering not peeling off as in the more advanced stages of the disease ; and the same remark applies to the third stomach (leafy) ; but the fourth (digestive) was studded with red circular spots, arising from the loss of the epithelium, *and not from ulceration, as stated by many.* The whole tract of the small and large intestines presented the characteristic congestive markings, with the pap-like matter between them in many places ; the trachea, the large column in the left ventricle of the heart, the endocardial membrane, and the vagina, all exhibited preternatural vascularity and ecchymosis. The aggregate glands, so prominent in health, were scarcely perceptible, a condition in which I have always seen them in this disease, and never in an ulcerated state, as asserted by many—a fact of great importance when taking into account the chances of recovery and the benefit likely to accrue from medical treatment.

Now, my Lords, the above case clearly shows the insidious nature of the complaint, and that during the period of incubation, when an animal is apparently healthy, latent disease of a formidable nature may be present, that our fairs and markets may abound with cows and oxen in the same state as the one described, infecting all around, and spreading the disease far and wide. The cow in question would have been bought by nine graziers out of ten, without a suspicion being entertained of the presence of the Cattle Plague. Thousands of animals, I believe, in the same condition are in our fairs and markets, and their flesh is sold for food. And this leads me, my Lords, to a practical and important matter, one that materially concerns the consumers of meat and the health of the people. After keeping a steak, cut from the cow I have described, for two days, I and a favourite cat breakfasted off it, and up to the present time no ill effects have been exhibited. I believe that the meat in the first stage of this disease is perfectly wholesome (I do not recommend its distribution among the people), and I question whether in the latter stage it would produce any injurious effects upon those eating it; but I hope, by a large series of experiments, to be able to speak more positively upon this subject. The unfortunate death of a veterinary surgeon at Sudbury, Suffolk, I believe, has led to very erroneous inferences respecting the poisonous nature of the cattle murrain, and its effects upon the human subject. I have met with a great many men with cuts and scratches on their hands and fingers, who are daily flaying and cutting up diseased animals affected by the Cattle Plague, but in no instance have I known any injurious effects from it. In this respect the disease forms a remarkable contrast to that of splenic apoplexy, to which I was the first to direct the attention of the profession in this country* in 1849, and in an essay on this disease published in the *Bath and West of England Journal of Agriculture*, 1863, I have given several examples of the injurious effects of this poison upon men, and of the fatal influence of the poison when eaten by pigs, dogs, and ferrets. Mr. Hamilton, one of the commissioners at the late exhibition for New South Wales, told me that, "when this disease was prevalent in that country, the men were so disabled from punctures and the imbibition of the poison, when flaying the sheep, that they refused to work unless they received an amount of pay adequate to the risk." The conclusions I draw from the foregoing are, Firstly, that the Cattle Plague abounds in our fairs and markets in a latent form, and that in this way the disease is disseminated to a fearful extent; Secondly, that, as far as my researches have gone, the common opinion that the meat of animals dying from Cattle Plague in the last stage is likely to produce pernicious effects when eaten by man is probably erroneous; Thirdly, that neither the exhalation from the bodies of animals dying of this disease, nor the introduction of the blood or secretions of such animals, by means of cuts and scratches, has, as far as I can ascertain, produced any injurious influence upon human beings; but, notwithstanding this, every precaution should be taken to prevent the ill effects that might arise in cases of cuts and scratches, by the immediate use of salt or spirits of turpentine.

I now come to the more immediate subject of my letter, viz., the structure of the ox, sheep, and other ruminants, in relation to this disease. I shall not touch upon minute and microscopical anatomy, for the accurate description of the intestinal canal of the ox alone would fill a large volume: my object will be to introduce such matters not generally found in books, that are the result of my own observations and dissections; and first, of ruminants generally, and I assume that every animal that chews the cud may be affected with this disease, supposing that the accounts we have from Russia and Germany of the existence of Cattle Plague in the sheep are correct, but probably the ovine race in this country will not suffer materially from this outbreak. The great length of the alimentary tube of a ruminant is one important feature in the structure, and it is one that has an important relation to this disease. To give your Lordships a correct notion of the extent of this canal in the various species of ruminants, I subjoin a list of some that I have dissected. The extract is made from the "Proceedings of the Zoological Society of London, February, 1864," and the measurements were all made by myself:—

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* "On the Structure and use of the Spleen" (out of print).

	FT.	IN.
Giraffe, old female, 18 years (*C. Giraffa*)	254	0
„ young male	209	0
„ young, two months	107	11
Eland (*O. canna*)	161	0
Bubaline antelope (*A. bubalis*)	94	6
Old leucoryx (*O. leucoryx*)	94	6
Young male do.	65	0
Addax (*A. nasomaculata*)	72	0
Boutiboc (*A. pygargus*)	64	2
Dykerboc (*C. mergens*)	95	0
Rheitboc (*E. arundinaceus*)	48	0
Springboc, young (*G. Euchore*)	38	0
Sing Sing (*A. kob*)	64	0
Gazella *vera*	37	4
Indian antelope (*C. bezoartica*)	39	0
No. 2 do.	44	0
Bennet's gazelle (*G. Bennettii*)	43	0
Dorcas gazelle (*G. Dorcas*)	41	5
„ fœtus, 15 oz.	10	6
Indian antelope (*A. Cervicapra*)	64	0
„ „ young, a few weeks old	33	6
Philancomber antelope (*C. Maxuellii*)	39	8
Isabelline antelope, young (*A. Isabellina*)	31	0
Four-horned antelope (*T. quadricornis*)	50	10
Hartebeest (*B. caama*)	83	2
Nylghau (*P. picta*), at birth 14lb.	32	2
„ old female 148 ft. 10 in., old male	140	0
Reindeer, old female (*C. tarandus*) 120 ft., No. 2	126	0
Mexican deer (*C. Mexicanus*)	52	6
Malacca deer, young	48	4
Sambur deer (*C. Aristotelis*)	80	0
Rocky Mountain deer	68	0
Virginian (*C. Virginianus*) deer, two days old	18	2
Musk deer (*M. moschiferus*), weight 3lb.	13	5
Elk (*C. alces*)	129	0
Camel (*C. Bactrianus*)	159	6
Alpaca (*A. pacos*)	70	0
Huanaco (*A. huanaco*)	95	0
Goat, four months old	30	0
Brocket	55	9
Mufflon (*O. Musmon*)	46	7
Aoudad (*G. tragelaphus*)	91	0
Cape sheep (*O. aries*)	97	7
Southdown lamb, six months old	74	9
Old Southdown ewe	109	8
Leicester ram	117	0
Ox (*B. taurus*) 123ft., 136ft., 140ft., and	186	0
Bison, old (*B. Americanus*)	157	0

All the above animals, excepting the *camelidæ*, have the same number of stomachs (four) as the ox and sheep; but there is a great difference, as I have shown elsewhere, in the character of the intestinal glands and *sacculi*, as in the camels, llamas, and guanachos, the *rumen* (paunch) is smooth, and free from villi; unlike the same part in other ruminants. To give some notion of the capacity of the alimentary canal in a ruminant (and the same will apply to nearly all, if the size of the animal is taken into account), let me quote an extract from my paper on the "Anatomy of the Bactrian Camel (*C. Bactrianus*)."* No one can form a proper notion of the immense size of the camel's stomach unless it is seen distended; when in this state, the following are the measurements and capacities of the various parts: the length of the œsophagus, 6 feet; of the rumen, 43 inches; its circumference, 5 feet 6 inches, and it holds (including the water-bags) twenty gallons of water. The length of the second stomach is 21 inches, and its capacity about six quarts. The third stomach is 34 inches in length, and holds about three gallons of water. The fourth stomach is 18 inches in length, and will contain three quarts of water. The fifth cavity is 9 inches long, and holds about two quarts of water. The capacity of all is about 25 gallons 3 quarts; and the length of all, when distended, is 9 feet 6 inches. As regards the quantity of water that these cavities hold, I cannot pretend to speak with perfect accuracy.

If we take the capacity of these gastric cavities in the ox and sheep, we shall find that, taking size into account, they will be larger than in the camel. The stomachs of a large ox will probably contain 20 gallons of water, but in the ox and sheep we have a more complicated digestive apparatus than in the camel. Let us briefly examine that of the ox: all the stomachs are supplied with villi, folds, and elevations of the membrane, so as to multiply the absorbing surface to an enormous extent. In the paunch, the leaf-like villi in some parts number about 206 to the square inch. Along the whole course of the alimentary tube we have longitudinal and transverse folds, so as greatly to increase the superficies; and, in addition to these, we have in the ox, besides millions of villi, long and numerous aggregate glands. In a healthy bull that I have recently dissected, the total length of these glands was 18 feet, and they varied in width from one-third to one inch; but as I have remarked before, in Cattle Plague these glands, probably from want of use, are small; for the first and third stomachs are generally blocked up with vegetable matter. Fancy, my Lords, the influence a millionth of grain of arsenic must exert amongst a hundredweight of dry vegetable food! And it is this stoppage in the first digestive cavities—this paralysis, it may be, of the very fountain of nutrition, that leads to the difficulty of treating this disease, as I hope to show in my next letter. There is nothing in any other structure of the ox, that I know of, that materially concerns this inquiry, except the tongue, which, as is well-known, is furnished with spines, as in the lion, and in many carnivora, probably to enable the animal better to take the coarse grass, to which it often gives a preference.

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* "Proceedings Zoological Society of London, March, 1865."

I have stated that the alimentary tube of the ox varies in length from 120 to 180 feet; that of the sheep from 70 to 117; but the great difference in the digestive apparatus of the ox and sheep is the absence of spines on the tongue of the latter, and the less complicated glandular structure of the alimentary tube. The foldings and doublings in the intestines of the ox are scarcely seen in the sheep, and the aggregate glands in the latter animal are comparatively of small extent and less elevated. In the intestinal tube of a lamb now before me, I find that these glandular patches amount to ten, each about three inches in length, and about one-third of an inch in width. These differences, however, scarcely serve to explain the comparative exemption of the sheep from this disease.

In my next letter, my Lords, I hope, to describe the pathology of this "Cattle Plague."

I have the honour to be, my Lords,
Your obedient servant,
EDWARDS CRISP, M.D.

42, *Beaufort Street, Chelsea, Oct. 7th*, 1865.

Remarks.—It must be apparent to all that the length of the alimentary canal in a ruminant, and its complicated structure, must be a great obstacle in the cure of Cattle Plague, for nearly every part of the tube is more or less affected in this disease. The capacious paunch, too, is in most cases filled with dry food, another great obstacle to the beneficial action of medicine.

LETTER IV.—SYMPTOMS AND PATHOLOGY OF THE CATTLE AND SHEEP PLAGUE.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—As I stated in a letter to Mr. Helps, as the Government refused my services to investigate this disease, I have undertaken the inquiry at my own expense, and I am now in the neighbourhood of Norwich, for the purpose of studying the plague in sheep. In my present letter it is my intention to describe the general symptoms and pathology of "Cattle Plague," *as the result of my own examinations*, reserving the minute and microscopical pathology for a future communication; and to avoid tedious repetition I will at once place before your Lordships the conclusions that I gave at the Pathological Society of London, October 17th, as published in the *Medical Times and Gazette*, Oct. 21st, page 455:—

1. That the so-called "Cattle Plague" or typhus fever, bears but slight resemblance, either in its symptoms or morbid appearances, to the typhoid fever of man.

2. That looking to the symptoms and pathological changes, and especially to the rapid recovery in some cases, the malady bears a greater resemblance to some exanthematous diseases in the human subject, affecting, in ruminants, chiefly the mucous membranes.

3. That the specific poison of this disease alters the condition of the blood, and affects especially certain parts of the nervous system, paralyzing the digestive organs, and thus sapping the foundations of life.

4. That the disease is attended in most cases with a specific eruption, or exanthematous blush, affecting more or less all the mucous membranes of the body.

5. That an animal may be suffering from this disease in its first stage without the possibility of detecting it, and in this way the plague may be disseminated in our fairs and markets to a fearful extent.

6. That there is no sufficient proof that the meat of bulls, cows, oxen, calves, and sheep in the first stage of the disease is injurious to human beings that partake of it.

7. That the poison of "Cattle Plague" (with the exception of a papular eruption on the skin), produces no injurious effects when introduced into the human system.

8. That the best means of eradicating the disease is to prevent all movements of cattle and sheep for a month or six weeks (except under special circumstances), and by the establishment of dead-meat markets in all our cities and towns.

You will see, my Lords, that the views I take respecting the nature of this disease differ (as far as I know) from any that have been previously promulgated. How the general opinion "that the malady is of a typhoid character" can have gained ground, I am at a loss to understand; for, not only are the morbid appearances in the sheep and ox essentially different to those in typhoid fever, but the symptoms bear little or no resemblance to those present in these diseases. The animal in "Cattle Plague" is very often in some districts fatally stricken down in twenty-four hours, with scarcely a premonitory symptom. Of the 160 oxen that died at Crown Point, Norwich, the average duration of the attack was nearly twenty-four hours, and scarcely one of these animals was treated, so rapid was the progress of the disease. All of them died. The deadly poison exerted its subtle and baneful influence for several days, as I believe, without external manifestations; and then, when too late for remedial measures, the animals succumbed.

It is this *concealed* and *latent* character of the disease, as I said in my last letter, *that renders all movements of cattle and sheep so dangerous.* As I have been especially investigating the nature of this disease in the sheep, it will be well, *by way of contrast,* to run over the chief symptoms in the ox before I describe the morbid appearances. These are—fever, with alternate paroxysms of heat and cold; dull, watery eye, with redness of conjunctive membrane; discharge from nose and mouth; anxious and melancholy expression of countenance; the head down, ears back; arched spine, staring coat, redness of the mouth and fauces; feeble and quick pulse; prostration of strength; staggering gait; loss of appetite, and cessation of the ruminating process; quick respiration, moaning and groaning; short dry cough (sometimes); tenderness about the lumbar region of the spine; in cows, suppression of the lacteal secretion; redness of the rectum and vagina, in many instances; constipation often in the first stage, followed by diarrhœa of an offensive character, the evacuations having a peculiar smell, and being sometimes tinged with blood.

On applying the ear to the chest the respiratory murmur is but indistinctly heard, the lungs not being fully expanded, and there is not unfrequently a "boggy feel," as it is called, over the loins, from the disengagement of gas.

The symptoms vary much in different cases, according to the stage of the disease and to the peculiarities of constitution: some of them may be absent altogether. Thus I have recently seen five oxen killed, in which I found the disease fully developed; but in none of these were there any red patches on the tongue, lips, or cheeks; "the arched back and staring coat" so often spoken of are frequently not present, and some of the other symptoms enumerated above may be absent, or may be materially modified. I have reason moreover to believe that, as in the exanthematous diseases of man, this affection sometimes appears in a mild form, so that animals that are said to have escaped it have been so slightly indisposed as to lead to the conclusion that they suffered only from cold and fever. In cows, the secretion of milk is sometimes wholly or partially suppressed; they are feverish and off their food for two or three days, and then quickly recover.

Pathology.—After death the characteristic marks of the disease are redness more or less throughout the smooth parts of the alimentary canal. In the first, second, and third stomachs, the exanthematous blush is apparent in many parts when the epithelium is removed, and the last-named cavity sometimes exhibits red patches on the leafy surface, from the loss of the epithelium: the so-called inflammation often assumes the character of an exanthematous blush, affecting especially the conjunctival, buccal, trachial, and bronchial membranes, the fourth (or true digestive) stomach, the intestines, the bladder, and, in cows, the uterus, vagina, and mammary gland. In addition to these, there are often red patches of a rounded form on the tongue, cheeks, fauces, on the third and fourth stomachs, the cæcum, and sometimes on the bladder and vagina. These patches have at first sight the aspect of ulcers; but on a careful examination they are seen to arise from the loss of epithelium only: the ridges and folds of the intestines are often intensely red, presenting a retiform or net-like appearance: *ecchymoses* are often present, and blood in some cases is extravasated on the surface of the intestine. The aggregate glands, or Peyer's patches, which in health are so prominent in the ox, are scarcely perceptible in this disease, and I have never seen them ulcerated, as in the last stages of typhoid fever. In some cases a lymph-like exudation is present on some parts of the alimentary tube, as well as on the upper air-passages; and yellow pap-like matter often covers portions of the mucous surface. The lungs are generally slightly congested, but free from structural disease. The endocardial membrane of the heart, especially in the left ventricle, is preternaturally vascular, and not unfrequently blood is extravasated below the surface. The blood is generally fluid, and has a tendency to escape from its proper vessels; but in my next letter, when describing the microscopic appearances, I shall enter more fully into this matter. The pancreas (lower sweetbread) is vascular, and decomposes very quickly; the kidneys are congested, and the liver and spleen in a normal state, forming a remarkable contrast to the condition of the spleen in human typhoid fever. The gall-bladder generally distended with bile. The brain and spinal cord are preternaturally vascular, but no perceptible alteration, by the naked eye, is seen in their structure. The fat over the kidneys and on the loins is (sometimes) resonant on percussion, from the disengagement of gas.

Let me now speak more fully of the condition of the four stomachs. The paunch, in all cases that I have seen, is loaded with dry food, or food in a drier condition than natural; the second stomach is comparatively empty; but the third, or leafy cavity, is hard, and filled with desiccated food—so hard, in many instances, that the contents form an insurmountable barrier to the action of medicines. I have, moreover, seen the whole of the epithelial membrane detached from the folds, and firmly adherent to the dry food between them. In many examples the mucous lining of the gastric cavities is not so much softened as in other diseases of the ox; but in the latter stages of the affection the lining membrane of the third and fourth stomachs readily peels off immediately after death. The important and practical fact in connection with this state of the gastric cavities is, that animals feed a short time after the invasion of the disease, but do not ruminate, and hence, in addition to the structural lesions enumerated above, there is an overloaded stomach, and the assimilative and digestive powers of the organ are at the same time paralyzed by disease and enervation.

I have as briefly as possible described the symptoms and morbid appearances in the ox, so that I may compare these with the symptoms and morbid changes of the so-called Cattle Plague in sheep; and the matter is one of great importance to the nation at large, because the generality of farmers that I have met with are unwilling to believe that sheep can be affected with this murrain, and hence proper precautions are not taken to prevent its extension.

I went to Norwich on the 21st of October, and through the kindness of some members of the Cattle Plague Association, of Mr. Wells, the intelligent veterinary surgeon, and of Captain Lambert, I was enabled to study the disease in the living animal, and to investigate it after death. I may premise that my frequent examinations of lambs and sheep during many years will enable me to speak with some degree of certainty on this question, although it is one I admit that is beset with difficulties.

In Mr. Harvey's park at Crown Point, where the oxen died, there were 2,060 lambs, which fed where the cattle fed; and after the death of the latter some of the lambs were attacked, and they have continued to die daily ever since, so that only about 730 are left, and of these probably the greater number will perish. The symptoms are at first dryness about the nostrils, followed often by muco-purulent discharge, redness of the conjunctival membrane, head down, ears depressed, loss of appetite and absence of rumination, dry cough, thirst, frequent diarrhœa, the discharge from the bowels being of a dirty yellow colour. The duration of the disease, from the appearance of the first symptoms, from 20 to 70 hours. Many lambs that have recovered lose a part of their wool, as is the case in other diseases of sheep where the blood is vitiated and the debility great. Of these lambs, I examined at the "cemetery" on the 23rd of October, four; 24th, six; 25th, nine; and the 26th, four. In addition to these, I had an opportunity of seeing, through the kindness of Mr. Wells, a living lamb that had been inoculated from the ox, and of examining its viscera after death, as well as the viscera of another lamb that had been turned when in a healthy state among diseased sheep; but the latter cases may be reported elsewhere, so I refrain from further allusion to them at present. I append a table of the autopsies of 23 of these lambs. In all I made a very careful examination, and in 19 I laid bare the whole length of the alimentary canal. I have tabulated the appearance of the eye, tongue, mouth, the lungs and air-passages, heart, blood, the various parts of the digestive apparatus, the pancreas, liver, spleen, kidneys, bladder, urine, vagina, uterus, ductless glands, brain, flesh, and wool. I now give the general summary from this table. The first and most notable change was the distended appearance of the heart in all, with dark, shiny, treacle-like, defibrinated blood; the clot imperfectly coagulated, and in only one instance, where the lungs were inflamed, was there fibrine upon the clot. The blood in the mesenteric and other veins was thick and fluid; and to show how much this state of blood influences the morbid appearances, I found that the uppermost eye was bloodless, whilst that nearest to the ground had the vessels of the conjunctiva much congested. The larynx, trachea, and bronchial tubes were all highly vascular; but the vessels, unlike those in ordinary inflammation, could readily be emptied of their blood by pressure with the finger, leaving the rings of the windpipe white until the vessels refilled. This state of blood somewhat resembles that which I have seen in poisoning by prussic acid. In this condition of the circulating fluid it is not to be wondered at that nearly all the organs were in a congestive or vascular state. The brain, lungs, air-tubes, heart, kidneys, and pancreas, were preternaturally full of blood, but, with the exception of the lungs and kidneys, no structural alteration was present. In 8 the lungs were either in the first stage of inflammation or partly solidified by old-standing disease. In 3 the kidneys were divested of their capsules, from the generation of gas, an alteration I have seen in many species of ruminants. In all, the liver was more or less softened: in 10 it was granular, and easily lacerable, the finger passing readily into its substance. The gall-bladder was generally distended with bile. The spleen in all was of small size and healthy. As stated before, in 19 I examined the whole tract of the alimentary tube; in 6, parts only of the canal were inspected. In all, red patches were absent from the mouth and tongue. In all, the stomachs were softened, and the epithelial membrane readily peeled off. In 16 the fourth stomach was universally red or covered with irregular-shaped red spots, less definite in form than in the ox. In 5 the fourth stomach presented little or no trace of redness, and the red markings and mottlings of the intestines were indistinct. The cæcum in nearly all was more or less spotted or ecchymosed : the other intestines red in many places, but not generally presenting the same mottled appearance as in the ox. The rectum, near to the anus, in nearly all, was congested and streaked with red. In 10, Peyer's glands were of a claret colour, but not ulcerated ; and the red patches in the fourth stomach did not present the same raw appearance as in the ox, the epithelial membrane being entire. In three, lymph-like exudation was present in some parts of the intestinal mucous membrane ; and in one, this exudation was confined chiefly to the root of the tongue and to the upper part of the larynx. If I had inspected some of these lambs only, I might have come to the conclusion that the disease was of a doubtful kind ; but a more extended examination convinced me that the disease was "Cattle Plague," modified somewhat in the sheep, as shown by the mottled appearances I have described. I have witnessed the same condition of the blood in ruminants dying at the Zoological Gardens ; but the erythematous and spotted aspect of the fourth stomach, and the mottled appearance of some parts of the intestinal tube, I have never before observed. In addition to the softened state of the liver in the sheep, the dark and tarry condition of the blood, the general softening of the lining membranes of the stomachs, the absence of red patches on the lips, cheeks, and tongue, the contents of the gastric cavities present a remarkable difference to those seen in the ox. In the sheep, judging from twenty-eight that I have examined, the food in the stomachs is always soft and pulpy, and never presents the dry appearance it does in the ox when affected with this disease. There is another peculiarity worthy of note, viz., that, as in the so-called typhoid fever of pigs, the young appear to be chiefly if not solely affected. (This is a mistake.)

I have not space in this letter to enter into the condition of the lambs at Crown Point, and the nature of their food when attacked, but I may observe that, as far as I can judge, thousands of lambs in England are worse fed and worse cared for, and, notwithstanding this, are in good health. The same outcry was raised about the London cow-sheds ; but it is notorious that the mortality has been as great, if not greater, in some of the most healthy parts of England, as in localities where the atmosphere has been impure and the animals densely crowded. Let me take the parish of Melford, Suffolk, where I spent four years of my pupilage, and to which place I journeyed from Norwich. Besides the well-known losses sustained by various farmers in this healthy district, the cattle in Melford Park, as at Crown Point, were all destroyed, either by disease or by the pole-axe, with the exception of one solitary ox that I visited ; his grave had been dug, but, notwithstanding his helpless and hopeless condition, he cheated the Government and the inspectors, and there he grazes, his well-filled paunch and sleek coat telling plainly that his vitals have recovered their pristine soundness. If he could speak, my Lords, what a lecture he might give to the Government on their tardiness and supineness in this fearful calamity !

In this neighbourhood, through the kindness of Messrs. Brown and Godbold, veterinary surgeons, of Sudbury, I visited the farm of Mr.

Hicks, of Hinney. This gentleman bought ninety-nine lambs at Colchester market, that came a short time before from Horringer fair; the hundredth was turned out, because it was unwell. Shortly after their arrival at Mr. Hicks' farm, the lambs began to die, and on Saturday, October 28, Mr. Hicks had lost fifty of them. I examined two that had died on Thursday, with Mr. Godbold, and both these were unmistakably affected with the "Cattle Plague;" but, in a living lamb, which Mr. Hicks kindly allowed to be killed for our inspection, we found, with the exception of slight redness in the fourth stomach, no appearance of disease. It should be noticed, however, that this lamb fed and chewed the cud. As I have stated in a former letter, I believe that this disease will never become so fatal in sheep as in the bovine race; but, my Lords, it behoves the Government to be "up and stirring," and to lose no time in the adoption of more stringent measures than those hitherto employed to check this fatal and wide-spreading malady.—I am, my Lords, yours respectfully,

EDWARDS CRISP, M.D.

42, *Beaufort Street, Chelsea, Oct.* 31, 1865.

Remarks.—It will be seen by this letter that I was the first to describe this as an exanthematous disease, and to show by experiments upon myself and upon the lower animals that the flesh of Cattle Plague oxen might be eaten with impunity, and that a papular eruption was sometimes produced upon the skin of those flaying cows and oxen. The statement I have made respecting the appearance of the lower eye of the sheep where the blood could gravitate, and the other fact that the vessels of the trachea and other parts may be emptied of their blood, and then refilled when the pressure is removed, tend, I think, to throw great light upon the pathology of Cattle Plague, in which we have, from an altered state of the blood, a series of congestions and extravasations in the shape of hemorrhagic spots, stains, ecchymoses, and discolourations, not depending, I believe, upon inflammation, as has often been supposed, but upon stagnation of blood and upon its exudation from its containing vessels. The general staining and extravasation of blood under the endocardium of the left ventricle of the heart and other parts is very remarkable. Among my wax preparations exhibited at the Pathological Society, which I took first in plaster of Paris, and coloured them from the morbid parts, I have some curious specimens; several of rupia-like spots on the surface of the urinary bladder—old ulcers of the intestines, which were supposed erroneously to have been the result of Cattle Plague. An account of some of these specimens will be found in the proceedings of the Zoological Society, Oct. and Nov., 1865, as well as of other matters relating to this disease in ruminants. The account of the examination of two cows on the same day, one on the first day of the disease, and the other about the twenty-first day, I think will be found interesting to my professional readers. My object has been to give the leading symptoms and morbid appearances in sheep and oxen. I might have prolonged this account considerably by entering into minute details, but it would lead to no good result. It has been found by Professor Gamgee and others that the temperature of the vagina is increased two or three degrees in Cattle Plague. It will be interesting to ascertain the temperature of this part in pleuro-pneumonia, and in other febrile diseases of cattle, by way of comparison.

LETTER V.—ON THE SUPPOSED TYPHOID NATURE OF CATTLE AND SHEEP PLAGUE.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—In my former letters I expressed the opinion that Cattle Plague was not of a typhoid nature, but that it bore a greater resemblance to some of the exanthemata that affect the human species. As this question, my Lords, is one of vital importance as regards treatment, I shall devote the subject of this letter chiefly to its consideration. It must be evident to those even who are unacquainted with the treatment of disease, that to prescribe for a malady without knowing its nature and pathology is like working in the dark; that to apply irritants to a mucous membrane already preternaturally vascular, may be adding "fuel to flame." But few diseases are, strictly speaking, curable; and it is the duty of the physician to watch nature, and assist her operations—not to thwart them—and, above all things, to avoid meddlesome interference. And here, my Lords, let me say a few words on the assumed success of the homœopathic treatment in Holland, as reported by Viscount Bury at Norwich, although I shall have occasion to devote one letter to the consideration of this subject.

The cures, as reported by Lord Bury, are said to have amounted to seventy-five per cent.! My Lords, if Dr. Hamilton had made himself acquainted with the pathology of Cattle Plague, he must have known that, unless the disease assumes a milder type than at present, such an amount of success, under any mode of treatment, is utterly impossible. The ten-millionth part of a grain of arsenicum, phosphorus, thus, sulphur, or quinine would have, as I believe, less effect upon this disease than the proceedings of a certain old lady had upon the ocean. The cases treated, I make bold to say, were not genuine cases of Cattle Plague.

I make the subject of homœopathy the introduction to my present communication in consequence of the statement made by Professor Simonds at the Farmers' Club, on Monday last (Nov. 6th), "That Dr. Hamilton would have a fair trial, and that a certain number of animals would be given to him to experiment upon." As Professor Simonds has been almost the sole adviser of the Government at this important crisis, I presume that this arrangement is made with the sanction of your Lordships, or by the advice of the Royal Commissioners. My Lords, it is a very fit and proper beginning for the Government, who from the first have dealt in infinitesimals, not only as regards the prevention of the spread of this disease, but also in relation to the amount of knowledge that might have been obtained, if the advice I gave in my first letter had been adopted. Experiments, unless they are carried out on a large scale, are not only useless, but they are sure to lead to injurious results. If these trials be made, certain regulations must be adopted: experiments practised on eight or ten animals will lead to no satisfactory conclusions. A hundred cattle at least would be necessary; and even then, unless very accurate and careful records are kept as to the exact stage of the disease, the symptoms, the dose of the medicines administered, no good will follow. In addition, moreover, to every twenty animals treated homœopathically, twenty must be left entirely to nature, so that it may be seen whether the "do-nothing treatment" and the globular do not amount to the same thing.

Let me, my Lords, give an exemplification or two of the fallacy of the conclusions likely to arise from such a mode of proceeding, unless the comparative method is adopted. The preservative power of nature is so potent that men, and the lower animals also, will get well in spite of the officiousness of the doctor. As reported in the *Medical Times and Gazette*, Dr. Colling, Massachusetts, U.S., stated at the Medical Society of that place, that during the epidemic of typhus in 1847 and 1848 he took care of 300 cases of this fever *without administering drugs.* The cases were taken indiscriminately, and included those in a dying state. The result was 31 deaths in 307 cases. In an epidemic of scarlet fever (1848, 1849), out of 81 cases so cared for 77 recovered. In 1849, of 40 cases of measles treated without drugs, 39 recovered. In the *Dublin Medical Press*, October 25, 1865, p. 388, in Dr. Nicholls' medical report of the Langford Poor-law Union, of 135 cases of fever treated without stimulants, 7 died; and of these some were admitted in a hopeless condition. Of 47 cases of small-pox, 1 died. Of 30 cases of scarlatina, 3 died. Of 220 cases of measles, 11 died. Dr. Nicholls remarks that he still continues the unstimulating mode of treatment, that for sixteen years he has found so successful. Dr. Mills, of Dublin (as mentioned in his work on the utility of blood-letting in fever, 1813), states that he treated 504 cases of typhus by small bleedings from the arm. Out of these only 18 died.

I allude to these cases—and they might be multiplied to a great extent—for several reasons. Firstly, to show that if the patients had been treated by globules, the result could scarcely have been more successful. Secondly, to endeavour to convince the modern advocates of stimulation in *all* diseases that patients *may* recover from fever without alcohol. Thirdly, for the purpose of showing that vitiated and impure blood may be taken from the body in typhus fever without killing the patient; and lastly, to especially exhibit the great difference between the mortality of the Cattle Plague and human typhus.

With these preliminary remarks, I proceed to the main purport of my letter—viz., as to the resemblance the so-called cattle murrain bears to typhus or typhoid fever in the human subject. On Monday last, at the meeting alluded to, Professor Simonds told the farmers *that the disease was of a typhus or typhoid nature, but that he thought it more like typhus fever.* As you are probably unacquainted, my Lords, with the history and practice of medicine, I will endeavour to make my remarks as plain and intelligible as possible, so that they may be understood by all. My previous conclusions have been the result of my own observations; but in the following *résumé* I shall have to borrow largely from the best writers upon the subject of fever, many of whom have added valuable statistical information to their works.

In this country we have four fevers that prevail at certain times; but one (the typhoid) may be said to be endemic, as it is rarely or never absent:—1st, the simple fever; 2nd, the typhus; 3rd, the relapsing or "famine" fever; 4th, typhoid fever. Some suppose that these fevers are not specifically distinct, but only varieties of the same affection; this, however, is not the general belief, and it was only until about the year 1835 that the difference between these fevers was clearly recognized.

I need say but little about simple fever, as it does not arise like the others from a specific poison. These fevers may be generated spontaneously, or they may arise, as is generally the case, from causes that are under human control. There are some who deny that these fevers are contagious; but their number is gradually diminishing. As my object is to make a brief comparison between the symptoms and morbid appearances of the three last-named fevers and those of Cattle Plague, I will give a short outline of the important features of each. In all there are premonitory symptoms which are well known—heat, chills, languor, headache, dry skin, and quick pulse. The exact period of incubation is unknown, but it may probably vary from one to twenty-one days; some believe the period may be much longer. In the relapsing fever the premonitory symptoms are generally less marked.

Tpyhus, as is well known, has at various times made fearful ravages in camps, jails, and crowded and unhealthy localities; but in no instance on record has it spread in the same manner as Cattle Plague; indeed, as I said before, there are some who question its contagious nature—isolated cases both of typhus and typhoid fever often occurring without their being communicated to the attendants; in this respect forming a remarkable contrast to the contagion of Cattle Plague. There is another most important symptom absent in typhus and in relapsing fever—viz., diarrhœa; for, as a general rule, the bowels are constipated in these affections. In typhus a rash appears upon the skin from the third to the eighth day; but is not renewed as in typhoid fever.

In the relapsing or famine fever there is no eruption. This fever, as is well known, is the attendant on partial starvation, and on the deprivation of the ordinary necessaries of life; whereas the typhoid fever, unlike the two former, attacks people that are well fed and in good circumstances. In this fever a relapse generally takes place on the fourteenth day, and this may be repeated two or three times.

The typhoid fever, constantly present in this country, is, like typhus, attended with a skin eruption, appearing between the seventh and fourteenth days, sometimes very slight, and scarcely perceptible; but, unlike the eruption of typhus, it appears and disappears, its duration varying from fourteen to twenty-one days. This fever is not, like the others, so dependent upon unhealthy localities, bad ventilation, and aggregation of persons. It more frequently attacks young persons; and, after a certain period, is attended with tenderness about the abdomen, diarrhœa of an offensive character, the evacuations being of a dirty-yellow colour, and showing a great tendency to fermentation. The appetite is less impaired than in typhus, and the fever is not so contagious.

The duration of these fevers varies from three to six weeks, and the mortality in hospital and workhouse practice from 2 to 18 per cent., the famine fever being much less fatal. I believe in private practice the fatality is less. I have only given a brief outline of the characters of these fevers; but it is enough for my present purpose. Delirium, twitching of muscles, brown and dry tongue, petichial spots, and other symptoms may be present, according to the nature of the fever and the stage of the disease. By some, typhus and typhoid fever are classed with the exanthemata; but in speaking of exanthematous affections, I adopt the ordinary acceptation of the term, including scarlatina, measles, small-pox, &c.

We now come to the morbid appearances in these fevers, which are very important by *way of comparison.* For typhus fever there is no specific lesion; the organs generally, from the impure state of the blood, are preternaturally vascular, the lungs congested, and the spleen and other parts softened; *ecchymoses* may occur in the intestinal mucous membrane, and other accidental complications may exist, as in the other fevers.

In the relapsing fever the spleen and liver are generally enlarged, especially the former, and these are the chief morbid alterations.

In the typhoid fever, Peyer's glands, and the solitary glands in the lower part of the ileum, are generally enlarged and ulcerated, forming, in this respect, a remarkable contrast to the state of the intestinal mucous membrane in Cattle and Sheep Plague. The mesenteric glands, too, in this fever are enlarged, and contain a peculiar deposit; whereas in Cattle Plague they are nearly in a normal state.

So, my Lords, if we look to the chain of symptoms—to the morbid appearances—to the duration, the rate of mortality, and to the comparative contagious nature of the fevers of this country, and to the like matters in Cattle and Sheep Plague, we find such manifest and essential differences that the terms "typhus" and "typhoid," as employed by the Government and its advisers, must be abandoned. It is this error on the part of your Lordships' advisers, I believe, that has led to such disastrous results as regards treatment; for persons believing, on what they consider to be *high authority* that this disease is typhus fever, have poured stimulants and irritants into the stomachs of oxen, cows, and calves without limit, and in this way, as I believe, have greatly increased the mortality; globules and infinitesimals, although I deny their efficacy, would have had this merit at least, that they *could have done no harm,* and nature might in some cases have righted herself.

The subject of my next letter, my Lords, will be the question as to the liability of the Government to compensate all who have lost their cattle and sheep, and are still losing them, in consequence, as I believe, of the negligence of preventive measures that should have been taken at an *early* period of the outbreak.

I am, my Lords, yours respectfully,

EDWARDS CRISP, M.D.

42, *Beaufort Street*, *Chelsea*, *Nov.* 11, 1865.

Remarks.—I have nothing to add to the above descriptions. Homœopathy and stimulating treatment will be spoken of hereafter.

LETTER VI.—THE REPORT OF THE ROYAL COMMISSIONERS, AND THE LIABILITY OF THE GOVERNMENT.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—The noblemen and gentlemen employed in investigating the nature and origin of Cattle Plague (so called) deserve the thanks of the country for their disinterested and arduous services, although I differ from them materially as to the means to be adopted to stay the spread of this pestilence, believing that their recommendations are inconsistent and inefficient. I am, at the same time, my Lords, fully aware of the difficulties the Government has had to contend with, and the vast difference between the possibility of adopting sharp and stringent measures in this country and on the European continent. Another great difficulty in which the Government has been placed, and which I have already alluded to in my first letter, is the fact that we have nothing national in any of our scientific institutions! The opinions I now express are not new.* Since the year 1831, I have publicly advocated the establishment of a Faculty of Medicine in England, Ireland, and Scotland, the payment of professors by the State, and election by *concours*, as in France. We have medical, surgical, veterinary, and agricultural clubs in abundance, but no bodies like the Faculties of France, Austria, and Prussia, that the Government could consult on an emergency like the present. In this country, my Lords, the "ruling powers" give no encouragement to science; and the man who is exclusively its votary has only starvation and a garret before him. In the medical profession, many young men who have started well in the scientific race for fame have soon abandoned the pursuit, knowing that Government held out no rewards, and that fees were more likely to support them in comfort and respectability. But let me, my Lords, give a damning and convincing fact of the badness and inefficiency of our systems of medical government, viz., that whilst the schools of Paris are crowded with English and American students, such a *rara avis* in *this country as a foreign student is seldom or ever met with.* In France, men obtain their appointments by *concours*, and public competition; but here, my Lords, the statement made in *Punch*, some years since, that "Smith got his pictures well hung at the Royal Academy because his mother *washed* for an Academician," is a good illustration of the motives that govern scientific appointments in this United Kingdom.

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* *Lancet*, 1837, p. 606, vol. i.

But there is no evil, it is said, without its attendant good; and what a lesson does this calamity teach the Government! So inefficient and incompetent are the members of the veterinary profession considered, that, in a matter that especially and exclusively comes under their province, only one is thought fit to sit among the twelve Royal Commissioners! Such, at any rate, is the inference naturally drawn by the public. My Lords, if we had had a veterinary college (as in France) of which all who practise on the lower animals as veterinarians would be compelled to become members by examination, we might have had a commission chiefly composed of veterinary professors, who would have done honour to the country and to the cause of science; for it must be apparent to all, that those only are competent to investigate scientifically this disease who are acquainted with the anatomy, pathology, and habits of our domestic animals, and with the animal kingdom generally.

I will now speak as briefly as possible of some of the recommendations of the Commissioners. In my fourth letter I showed, from a careful and extensive examination of twenty-eight lambs, that the same disease now so fatal among cattle may also affect sheep; that it may be transmitted from oxen to sheep, and *vice versâ*; and that it may probably affect every species of ruminant;* that, therefore, the terms "rinderpest" and "Cattle Plague" must be abandoned, as well as those of typhoid or typhus fever; that the disease partakes more of the character of an exanthematous affection, and that the most appropriate name for it is the "malignant spotted fever" (*febris maligna guttata*), the spotted and mottled appearance of some of the mucous membranes in ruminants being peculiar to this disease. Now, my Lords, as the existence of this plague (as admitted by the Commissioners) is not confined to the bovine race, and as sheep in various parts of England are affected, it must appear strange to your Lordships and to the community at large, that, if it is right (as I have long advocated) to stop for a time all movements of cattle, the same law should not apply to sheep—animals that are more likely, from the nature of their woolly covering, to convey the disease than oxen. A flock of sheep driven along a public road would be more likely to disseminate the plague than a herd of oxen; but a greater evil than this even exists, for many skins of sheep dying of this murrain have not been disinfected, so that the fomites of the fever may be reserved for another occasion, and stored away for future mischief. Let me, my Lords, bring a practical example to your notice, in a disease less infectious and contagious than that of sheep plague. Some children were affected with scarlatina, and during the fever a small woolly dog (a well-known toy) was given to them, to play with. After the children had recovered, the dog was wrapped in paper and put into a drawer. Ten months after this, other children visited the house, and the same toy was given to them to play with. They all, in a few days, took scarlet-fever. If this were a solitary case, some doubt might be expressed respecting the correctness of the inference; but examples of a like kind, both in small-pox and scarlatina, might be greatly multiplied; and a sheep's skin from a plague-stricken animal, or from a sheep that has been with diseased oxen, may hereafter be the source of wide-spreading mischief and destruction; and yet, my Lords, the Commissioners' recommendations apply only to *cattle!* Again, the power of inspectors to destroy cattle in districts where the disease first makes its appearance is to be withdrawn, although it is admitted that "this power is right and useful when the disease appears in isolated spots." If right and useful, why should it not be exercised? The statistics of Mr. Maclean, and the permission given for foreign cattle to be sent to any market in Great Britain, I shall not comment upon. Mr. Maclean's errors are too transparent to need notice; and the proposition of allowing foreign cattle, that may have the plague in an incipient and in an undiscoverable form, to be carried over England, whilst our homebred beasts from unaffected districts are to remain still, is so startling and inconsistent that I can scarcely believe it will become the law of the land.

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* I now know of six species, but I believe the disease is confined to this class. —E. C.

I now proceed to discuss the main question of this letter, viz., the liability of the Government. The Commissioners state, in relation to the slaughter of cattle by inspectors, that, "as the hope of diminishing the disease is lessened, the inevitable waste increases, and the sense of hardship tends to become insupportable; but the objections to promising compensation to individuals out of the public treasury on an extensive scale appear to us insurmountable." The insupportable hardship endured by the losers of cattle from the Government poleaxe, and the insurmountable difficulty respecting compensation, appear to me to be as inconsistent as some of the conclusions I have already alluded to. But, my Lords, let us carefully and dispassionately consider this matter, not as special pleaders who try to make the bad appear the better reason, but in an honest and fair spirit, allowing always for the difficulties of the Government, and bearing in mind the well-known adage that "it is easier to find fault than to suggest a remedy." The question, my Lords, is a very important one, because Englishmen of all shades of politics, whatever they may think of the Government in other matters, believe that the rights of property are to be respected, and that those who suffer losses *for the public good* are entitled to remuneration; and if, as I hope to show, these losses, to a great extent, have arisen from the negligence of the Government in not having taken early and proper precautions to prevent the spread of the disease, the justice of the claim for compensation is placed, I think, beyond doubt or cavil. My Lords, I will endeavour to avoid personalities; but this is not a time to bandy fair words and compliments—the matter is too grave and important. When Professor Simonds, at the Farmers' Club, repeated more than once that "the Government had acted nobly in this matter," there was a general cry of dissent; and Professor Simonds scarcely believed, perhaps, that, in giving utterance to this "toadyism," he was complimenting himself as well as the Government. But let us inquire into this nobility of conduct; and I proceed to give your Lordships information that *should have been elicited from Professor Simonds by the Royal Commissioners in his evidence*, questions 1 to 401. In May, 1856, Mr. Blackwell informed her Majesty's Government, through the Consul-General of Hamburg, of the presence of this murrain in Mecklenburg. In September following, he tells the Government: "As this highly contagious murrain has spread from the Steppes of South Russia, through Poland, Prussia, and Mecklenburg, to Holstein, a district from which the English market is supplied with cattle, I must beg leave to call the attention of her Majesty's Government to my report of its origin, progress, treatment, &c., transmitted on the 30th of May last."

It might be supposed, my Lords, that, after this and other information from various sources that such danger menaced the herds and flocks of this country, the Government would at once have sent out a Commission to investigate this disease, and to guard against its introduction into this country; but instead of this, Professor Simonds was deputed by the three Royal Agricultural Societies of the United Kingdom to visit the Continent with Mr. Earnes (who was acquainted with the German language). Belgium, Holland, Westphalia, part of Denmark, Schleswig and Holstein, Hanover, Mecklenburg, Prussia, Silesia, and Galicia were visited. The last-named country was the only place in which the disease was seen, and in the Report, which is now before me, the symptoms and morbid appearances are described, about eight or ten inspections having been witnessed. Notwithstanding this flying visit, Professor Simonds states (Parliamentary evidence, question 17), "that after the satisfactory examination we had made, we did not think it necessary to go to the Steppes or to Lemberg." I think the Report in some respects does great credit to the gentlemen employed, considering the *short time* they had to investigate the disease; but I also think it will be admitted by your Lordships, that if a commission had been formed by the Government, of scientific and practical men, who had had time thoroughly to investigate the disease, and report *to the Government* upon it, that the result might have been very different. I beg especially to draw your Lordships' attention to two important conclusions in this Report, that would not have been arrived at if more time and labour had been given to the subject. It is said in the Report, and the error has several times been repeated by the Professor, "that the disease especially belongs to the ox-tribe, and that it has never been known to attack any other domesticated animal" (Report to the Privy Council, Aug. 3, 1865). If foreign authors had been consulted, it would have been seen that several had named its occurrence in sheep and goats. But it is the concluding part of the Report which I have especially to condemn, and such a vital error I believe could not have been made by a commission properly appointed by the Government. Professor Simonds gives no warning of the possibility of the introduction of the disease into this country; but, on the contrary, his concluding words in the Report are that "no fear need be entertained that this destructive disease will ever reach our shores, not only on account of the distance, but on account of the hundreds of military cordons that it must pass through. All alarm, we believe, may cease with reference to its introduction into the British Isles." My Lords, the great wonder is, considering the laxity of the Government, and the facilities of import, that England has so long escaped the malady! As reported to the Commissioners (q. 2,588, and note p. 6), in July, 1860, three years after Professor Simonds's Report, 20 Russian oxen were landed at London from St. Petersburg, and the Commissioners add that "the point is of no importance;" but to my mind, taken in connection with Professor Simonds's Report, it is a matter of *vast* importance, as showing how readily this disease might have been introduced in a direct manner from Russia.

But let us, my Lords, briefly consider some weighty circumstances in connection with the "Revel" cargo. Mr. Burchell's evidence, I think, leaves but little doubt that the disease was imported from Russia, by the *Tonning* (q. 3,221 to 3,349): for it must be remembered that both oxen and sheep that have been amongst diseased animals may convey the plague *without having it themselves.* But a matter that much more concerns the responsibility of the Government is the fact that, although according to the evidence of Mr. Lockwood, inspector of Hull, the animals were known to have come from Russia, no special order with regard to the *Tonning* had been issued by the Customs, and that it took the two inspectors only 3½ hours to examine the 600 sheep and oxen (q. 3,479), nearly three per minute! Some of the cattle were "mouthed," and two out of five of the sheep were turned on their backs (q. 3,464).

My Lords, those who have seen much of this disease know that every one of the oxen (321 in all) might have had this plague in an incipient form, without the possibility of detecting it, and that in an examination like that above described, a dozen animals that showed external signs of the disease might at this time have easily escaped detection.

Let us look to the orders of the Privy Council from the first, issued July 24th, to the present time, and nearly all will be found, as regards the prevention of the spread of the disease, useless and inefficient; indeed, the poison—by means of skins, hides, manure exposure, and transmission of carcases, transit by railroads of diseased animals, and the gatherings of sheep and cattle—has been so thickly sown throughout the country that it would require a prophet to foretel its decadence and extermination; and yet, my Lords, we have had one of the ministers, Sir Charles Wood, in Yorkshire, telling his audience that "he looked upon the Fenian movement in Ireland and the Cattle Plague to be of the same calibre."

It appears to me, my Lords, that another strange piece of neglect on the part of the Government was the tardy announcement of the name of this disease, so that more stringent measures might have been taken to guard against it at an earlier period. Professor Simonds (q. 164) saw the stomach and intestines of a cow of Mrs. Nichols, of Islington, July 4th; and on the 9th of July Professor Simonds made up his mind that it was the rinderpest; but in the Order issued by your Lordships as late as the 24th of July, when a great many animals had fallen victims to the malady, we are told that it is a contagious and infectious malady, "but that its nature is uncertain." I need not comment on the various Orders of Council, as they are well known.

The London cowkeepers, as the evidence abundantly shows, when the disease first appeared in London, knowing that their animals would be killed by the order of the inspectors without compensation, practised all kinds of evasion to cheat the Government. Dr. Tripe, Medical Officer of Health to the Hackney district, states (q. 3,732) "that, out of 1,220 cows in his locality, 596 from infected places were removed to the Islington market, 136 sent to the knackers, and that only nine of these were buried, and that no precaution was taken to prevent contagion." Mr. Field, dairyman of Westminster, who had lost a great many cows from the murrain, says (q. 4,012), when asked what becomes of his manure, "he thinks it goes down into Kent." Professor Simonds (q. 335) did not know positively about the disposal of the manure from the Islington market; but he thought there was great liability for the spread of the disease on account of the manure, and he had no doubt whatever that the disease had sometimes been conveyed by the inspectors themselves (q. 387).

But, my Lords, the evidence respecting the nature of this disease, when existing in this country in 1715-45, when the Government ordered animals to be buried, their hides slashed, and the owners to be compensated for body and skin, should surely have taught us a useful lesson respecting the danger of playing with this pestilence. In the report I have already alluded to by Professor Simonds, to which the Government had free access, it is stated, so contagious was the plague, "that people going into some districts were compelled to leave their clothes behind them, and that in some places all congregations of persons were forbidden, even at church." So that the nature of the plague, when it recently made its appearance in this country, was nearly as well known to the Government and its advisers as at the present time.

The excuse, my Lords, that the Privy Council has not had sufficient power is too futile and impotent to need comment. Parliament might and should have been assembled long ere this, although Mr. Disraeli has recently told his audience in Buckinghamshire that it would take sixteen days to effect this important object.

Let me, my Lords, in conclusion, allude specially to the evidence of Mr. Helps, clerk to the Privy Council, as it is a fair epitome of the proceedings of the Government. Questions 1,823 to 1,878: "The notice of the outbreak was given first on the 10th of July, and Professor Simonds was instituted to make an inquiry into it. Papers were published by Professor Simonds, and one on disinfection by Dr. Thudicum. Local authorities could exclude certain animals from fairs; and on the 11th of October (four months nearly after the appearance of the disease) arrangements were completed for burial in the metropolitan districts. The precautionary measures of the Privy Council had worked well. Requests were made that the orders should be more stringent. Many magistrates had said that it was useless to prevent a fair, if fairs were held adjacent to it. Beasts were not directly slaughtered, but found in butchers' places for two or three days. No Orders in Council had been issued in Ireland."

In speaking as a *private* individual, Mr. Helps would give the working of the orders to local authorities, by whom they would be carried out patiently and carefully; they will work as well as the Government. In the next few weeks fairs and markets will be considerably stopped. "Q. 1,863, 1,866, 1,867 : Good feeling and patriotism would overcome petty local interests. Except in Prussia, efforts in foreign countries have not been wonderfully successful." All must admire Mr. Helps's amiability; but few, I think, will applaud his patient method of putting out a raging pestilence!

I have, my Lords, adduced the above evidence for the purpose of showing that, if a man's property is destroyed for the public good, he should obtain some compensation from the State; but if, as I have shown, *and as it might have been demonstrated more clearly by evidence that could have been obtained by the Commissioners*, that the spread of this plague has been greatly increased and extended by the inefficient, inoperative, and inconsistent measures of the Government, I can scarcely believe, notwithstanding the recommendation of the Royal Commissioners, that Parliament will turn a deaf ear to those who are, as I believe, justly entitled to compensation.

Inspectors, it is true, are not now to kill and slay at their pleasure, even in districts freshly infected, *where they ought to exercise such a power;* but the Government has allowed this poison, now wide-spread and almost indestructible (unless *very* prompt means are taken), to do the deadly work of the pole-axe, and hence the liability to compensate the sufferers.

In my next letter, my Lords, I will speak of the treatment of this malignant fever by homœopathy; and of the efficacy of this pretended science as applied to the treatment of disease generally.

I am, my Lords, yours respectfully,

Edwards Crisp, M.D.

42, *Beaufort-street, Chelsea, Nov.* 18.

P.S.—That I may not be accused, my Lords, of fault-finding without suggesting a remedy, I again presume to advise your Lordships in this extremity. Parliament should be assembled at once; the Government should take the matter *entirely into its own hands;* destroy all animals *when necessary*, and compensate all losses; appoint a chief inspector for every county; kill *all* foreign animals at the ports, and all sheep and oxen where they now are; destroy all hides and skins of infected animals; stop all movements of sheep and cattle for six weeks, except under special circumstances, when permission must be obtained from the chief inspector; establish dead-meat markets in all large towns; order all dogs to be tied or shut up, and prevent hunting in every part of England. Better put up with *any* temporary inconvenience than risk the loss of our home stock, which, remember, can *never be replaced by foreign breeds.* Simple means will stop a fire at its commencement; but when it is raging in all parts of a city, private and public convenience must be disregarded.

Remarks.—As is well known, in the report which appeared October 31, 1865, five months after the appearance of the disease, Messrs. Lowe, Playfair, Quain, Parkes, Wormald, Ceely, and Spooner advised the stoppage of all movements of cattle, whilst Earl Spencer, Viscount Cranborne, Mr. Read, and Dr. Bence Jones recommend measures of a less stringent character. Mr. McClean would leave matters as they were. It will be observed that the movements of sheep were not prevented, and the treatment of cattle was allowed as usual; the members of Parliament were not to be disturbed, and a great many important measures for the eradication of the disease were neglected. The Government, with its leaning to local authorities, went blundering on, and it was not until February, 1866, when the House of Commons met, that an efficient Act was passed, but so badly were its provisions carried out, that the Government stultified its proceedings by reporting in about six months after the Act had passed 11,878 cases of recovery. The Royal Agricultural Society lagged behind the Parliament, and when all the mischief was done began to lock the door. I hope it will not be considered that I allude to the report of Messrs. Earnes and Simonds for the purpose of reflecting upon the conduct of those gentlemen, for their visit was too short for them to obtain much important information. I mention it to show that the Government, when it was known that such a disease was likely to reach our shores, instead of depending upon the Agricultural Societies, should have sent out a proper commission, who would have had full time for the investigation of the matter.

LETTER VII.—DOGS AND DISINFECTANTS.

TO THE RIGHT HONOURABLE THE LORDS OF THE PRIVY COUNCIL.

My Lords,—I am about to place before your Lordships two subjects connected with the prevention of the spread of Cattle and Sheep Plague, that I believe have not received that amount of consideration from the Government advisers and the Royal Commissioners that their importance merits; these are:—first, the destruction of the plague virus by fire, and the purification of skins; secondly, the extension of the pestilence by means of dogs and packs of hounds that are daily in this country passing from affected to unaffected districts.

In the supplement to the report of the Royal Commissioners, XXII., chloride of lime, carbolic acid, or the powder containing carbolate of lime or sulphide of lime, are recommended, and the latter (last) is supposed to be the best disinfectant.

In the interesting lecture on disinfectants delivered at the Royal Agricultural[*] Society (Dec. 12), by Professor Voelker, the professor says, "Articles of small value, such as ropes and half used up straps, should be burnt or buried. Shovels and stable utensils should be cleaned with soft soap and chloride of lime, half pound to a pailful of water."

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[*] *Mark Lane Express*, December 18th.

After the proper fumigation the floors were to be taken up, cleansed, and relaid, and the sheds afterwards whitewashed, &c. "Inspectors should visit the cattle in pattens. Chloride of lime, carbolic acid, Condy's liquid, McDougall's and Thomlinson's disinfectants, and many others, are named, but Professor Voelker admitted that he did not know of a single case where these and other supposed disinfectants prevented the occurrence of the plague, and he goes on to recommend that sawdust saturated with carbolic acid should be scattered over a cowshed; then six healthy cows should have a weak solution of this acid applied to them, and then a diseased cow should be introduced among them. This experiment should be made by Government" (the plan I suggested in my first letter, Sept. 21.)

My Lords, we are now in the seventh month of the plague, and we are still in the dark about the efficacy of the so-called disinfectants, and about the power and action of all medicines in this fearful disease, save and except Government "dynamics and ovations."

Let me again ask if the plan suggested in my first letter, Sept. 21, had been adopted by the Government, whether the same state of bewilderment and chaos would now exist? The pestilence ere this might have been entirely eradicated. But let me briefly touch upon the first subject of my letter, viz., purification by fire, which appears to have been overlooked by the Commissioners and by the learned Professor to the Royal Agricultural Society. In the use of fire I presume that the proprietor will superintend the operation himself, and have all necessary means at hand to put out flame if required, and moreover I infer that the common sense of every man will guide him in the careful employment of this agent.

Instead of washing spades and other implements with chloride of lime put them for a short time into a flame. If the wood is a little charred, they will last the longer. Take a link made of rope yarn and tar and apply the flame to all gates, posts, rails, mangers, crates, cattle trucks, and other *suitable things* that *may* have been in contact with diseased cattle. Instead of taking up brick and other floors, as recommended by the Professor, keep a smouldering fire upon them for some time. Let the flame from the link pass over the sides of the building to the height of seven or eight feet. Where brick, stone, plaster, and wood are concerned, there can be no danger if proper precautions are used, and I believe this method to be the most effectual and the cheapest where it can be *safely* employed. In addition to this, sulphur may afterwards be burnt, and the building limewashed and aired as much as possible. All clothes, rugs, sacks, and other suitable things, should be exposed to a dry heat of 212° Fahr., or placed in the solution, to be hereafter described, for one hour.

In this country many oxen are in open sheds and yards, the former covered with straw or reed, and the yards surrounded by furze or other faggots. In such instances fire cannot be used as a disinfectant, and the generation of various gases in the sheds would be of little use unless the gases could be confined for a time, a difficult matter under such circumstances. The only effectual way of purification will be to burn the faggots or bury them with the manure, with a good supply of quicklime. My Lords, I have placed before you this method of purification by fire, believing that its importance has not been sufficiently appreciated. I now bring before your notice a mode of disinfecting skins that I believe to be one of the best and cheapest that can be used. At the same time, my Lords, I contend that no skin should be disinfected, but that it should be buried at once with the carcase of the animal, as in 1745, and the Government should compensate the owner. The plague has been extended to a vast extent by means of skins, and so sure were the majority of the farmers that this disease would not attack sheep, that I believe thousands of sheep skins have been distributed about the country charged with fomites of this poison, and no attempt at disinfection was made. We are told in the *Times*, December 19, that the plague was introduced into Spilsby, Lincolnshire, by means of infected hides.

If the Government still persist in its present waiting policy and patchwork legislation, and hides and skins are preserved, I believe, from numerous experiments that I have made, that the following is the best solution that can be used. A large tub-full may be kept, and it will serve for many skins, which need only be in the solution a few hours. The subjoined are the proportions :—

Corrosive Sublimate, 100 grains.
Bay-salt, 6 lb.
Alum, 2 lb.
Water, 24 gallons.

The skins to be hung up over the tub, so that the solution may not be lost. But, my Lords, as I said before, no skins should be preserved and no animals flayed. The hundreds of men who have had their clothes and skins impregnated with this poison during the operation of flaying are sufficient to contaminate all the cattle on the habitable globe. A man who has skinned a dozen animals may become a focus of infection for weeks.

I now come to the subject of dogs, all of which I said in my last letter should be shut or tied up. A pack of hounds may be the means of infecting all England.

I first drew the attention of agriculturists to this subject in a letter in the *Mark Lane Express*, October 23. But let us ask what evidence we have that dogs are likely to convey the poison. It is notorious that where diseased animals are buried that dogs from the farms where the plague has not appeared have been attracted by the smell of the carcases, and in this manner the disease is disseminated. At Norwich the plague appeared in a dairy of cows that had, as it was thought, been strictly guarded; but it was found that a neighbour's dog was in the habit of sleeping under the manger, and this dog belonged to a dairyman whose cows had the plague. Mr. Freeman, of Bath, in the *Medical Times and Gazette*, October 30th, in describing the Cattle Plague in sheep, says that the pestilence was probably carried by foxes, which are very numerous in that district. But let me, for the benefit of those who obstinately deny the existence of the plague except in animals of the bovine race, allude to an example that will likewise show the extremely contagious nature of the poison, and how readily it may be conveyed.

A cow, July 29th, affected with the Cattle Plague, was driven along a public road where the gate of a stackyard was open. The cow entered, and went once round a straw stack, and was driven into the road. A short time after this two goats and several cows came into the stackyard from an adjoining meadow to be milked. On the 10th of August one of the goats died, and on the following day the plague proved fatal to the other; and after this eleven cows, one bull, three calves, a fat ox, and a heifer were lost by the same disease. These examples could be readily multiplied. Let us now consider the more important question of hunting, and I may premise that I am not a cockney, and that I have been as fond of the sport as most men, and could now distance many of my deriders across a good hunting country; but this is not a question of taste or pleasure, it is a matter of vital importance, and one that concerns the health of the people and the prosperity of the nation, and all should sacrifice selfish pursuits for the eradication of this pestilence. I could readily, my Lords, trace a pack of hounds and horses over an infected district with the urinary discharges of diseased cattle on their feet, into a district where the plague has not yet appeared, and show the great probability that the disease would be conveyed, but I am happy in being able to give a graphic description of a hunting field in Norfolk, where the plague had been so prevalent, by one of the Commissioners, Mr. Sewell Read, M.P., at the recent Farmers' Club dinner, December 12th. He said:—"Mention had been made by the Chairman of the honour conferred upon the county of Norfolk by the Prince of Wales becoming a Norfolk landowner and farmer. No one appreciated that honour more than he did, and it was a noble and soul-stirring sight to see the Prince of Wales in the hunting field in Norfolk. Whenever his Royal Highness was pleased to intimate his intention to join a 'meet,' every farmer within twenty or thirty miles round who could ride thought it necessary to go and meet him, so that as many as 400 or 500 mustered at one time in the field."

"Now, if the fox happened to escape such a mob of sportsmen, away they went over the clover, the young wheat, and the fences, &c." Mr. Read goes on then to describe the evils of game preserving in excess, but it does not appear to have struck him, although the evidence before the commission fully shows the subtlety and ready communicability of the poison, that a greater evil than the latter might lurk in the feet of the hounds and on the hoofs of the 400 or 500 horses that scampered over the country. It reminds one of the play of Hamlet with the character of *Hamlet* left out. I know it may be said diseased cattle are confined and secluded, but who, let me ask, knows when they are diseased? A pack of hounds may pass over a meadow where cattle are grazing, apparently in perfect health, and yet their alvine and urinary evacuations, carried by means of hounds and horses' feet, may (as I believe) infect a whole county. I hope, my Lords, that I have said enough to show that this matter is of great importance, and the sooner it receives the serious consideration of the Government the better. English noblemen and gentlemen, and especially fox-hunters, would be the last men in the world to pursue this sport if they thought it likely to be injurious to their neighbours or detrimental to the country at large, and I believe it is only from want of proper consideration that the sport is now continued.

I am, my Lords,
Yours respectfully,
Edwards Crisp, M.D.
42, *Beaufort-street, Chelsea, December 20th*, 1865.

Remarks.—We have no proof whatever that any of the agents described as disinfectants possess this power as regards Cattle Plague, but we have abundant evidence to show that animals surrounded by all these so-called disinfectants have been frequently affected. If the experiments I suggested in my first letter had been performed by the Government, this matter might have been long since set at rest. At this time skins were disinfected by mopping with chloride of lime—a process not likely to be properly carried out. I believe two or three hours' immersion in the fluid I have named, and subsequent immersion for five or six hours in cold water, would be far preferable; but all skins should be buried with the animal. As I shall have to speak of hunting in my tenth letter, I reserve my comments upon that subject.

LETTER VIII.—ON THE ASSUMED IDENTITY OF CATTLE PLAGUE AND SMALL-POX.

TO THE RIGHT HONOURABLE THE LORDS OF THE PRIVY COUNCIL.

My Lords,—The communication made to you officially by Dr. Murchison, and published in the *Lancet* (December 30), and in the journals generally, is of so much importance that I shall devote my eighth letter to its consideration; and, to understand the matter fully, it will be necessary to speak of a few circumstances relating to the recent occurrence of the disease in this country. At the meeting of the British Medical Association (August 1st, 1865), Dr. Budd, of Clifton, read a paper on the cattle plague, in which he endeavoured to show "*that the rinderpest was the precise pathological equivalent to human typhoid or enteric fever*." Three weeks after this, Dr. Murchison (*Lancet*, August 24) showed that neither the solitary nor the aggregate glands were affected in this disease, as supposed by Dr. Budd—no mention is made of an eruption upon the skin! but Dr. Murchison speaks of minute superficial ulcers in the intestinal tube. It is important to remember that Dr. Budd (as far as I know) was the *first and only person* in this country to make the analogy between this fever and that of typhoid fever in the human subject. I have fully pointed out the distinction between the typhus, typhoid, and famine fevers, in my fifth letter. Typhus fever was not mentioned either by Dr. Budd or Dr. Murchison, although Professor Simonds, the Government adviser, stated, at the Farmers' Club, as mentioned in my fifth letter, "that the disease was more like typhus fever."* On the 17th of October, as published in the *Medical Times and Gazette* (October 21), p. 445, I stated, at the Pathological Society of London, where I showed a large number of specimens of the morbid changes in this disease, that this plague bore little or no resemblance to *typhus*, or typhoid fever, in the human subject; *that it was an exanthematous disease of a specific character, attended with a specific eruption, and affecting more or less all the mucous membranes of the body; that the red patches were formed by slight effusion of serum under the cuticle*, and by the detachment of the epithelium; that the term "ulceration" was not applicable. I had repeatedly looked for eruption upon the skin in sheep and oxen; and I had often been told by men who flayed the carcases of both, that they had never seen any appearance of eruption. Of late, I have witnessed many examples of this eruption; but I fail to see the resemblance between it and the small-pox pustule that Dr. Murchison has observed. Mr. Moore, the homœopathic practitioner, says, in his pamphlet (August 20th, 1865), that, in white cows, he has observed a dark red eruption upon the body, and that the dewy part of white noses are marked with numerous small slate-coloured spots, flat, and not raised above the surface. He believes the observation to be original and important; "but whether," he says, "an accidental or an essential symptom, further observation must decide." In the report of the medical committee of the Norfolk Cattle Plague Association (December 8th, 1865), it is remarked (p. 15): "Quite recently the attention of your committee has been directed to the state of the skin; that in a large proportion of cases certain spottings or markings are present upon some portions of the skin; that these are papulæ, imperfect vesicles, or stains, &c., rendered more distinct during the first process of tanning." The committee came to the same conclusion as I had done three months before—that it is an eruptive disease, the discovery of the skin spots supplying the only link wanting.

The small pox in sheep is seldom or never absent from the European continent; and three attacks of this disease have appeared in this country—1710, 1847, 1862; the first described by Dr. Fuller, 1730; and the two last by Professor Simonds, 1848 and 1864; the former in a separate work, and the latter in the *Journal* of the Royal Agricultural Society (1864, p. 549). Dr. Budd, of Clifton, in the *British Medical Journal* (1863), has also given a good account of small-pox in sheep.

It must appear strange, my Lords, to men of common sense, when we have satisfactory evidence to show that the Cattle Plague may be communicated from sheep to oxen, and from oxen to sheep, that during the outbreaks of sheep plague in this and other countries, the cattle have invariably escaped the infection, and that goats—which are so liable to take Cattle Plague—when inoculated with sheep-pox matter have never been affected with the disease (sheep-pox).

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* This word is generally used by the French; and Hurtrel, in his work (to be mentioned hereafter), says: "The term 'contagious-typhus' originated with the Germans. The term 'ox-typhus' is also used."

It must appear equally strange that this supposed small-pox eruption, so prominent and readily distinguishable in the sheep when affected with small-pox, should have been discovered only during the process of tanning, when sheep have been affected with what is called " Cattle Plague." In the ox—judging from a great many animals that I have examined—no appearance of eruption was present externally, and often no spots or raw looking excoriations could be seen on the gums, lips, or cheeks.

Dr. Murchison says that the anatomical lesions of the two diseases are identical, viz., inflammation of the mucous membranes of the air passages and digestive canal, dark coloured blood, ecchymosis, and a pustular eruption on the skin; and, in confirmation of the truth of this statement, "Copeland's Dictionary" is appealed to. Let me quote a better authority than Copeland, viz., the late Dr. Gregory, physician for many years to the Small-pox Hospital, who in his work on the Practice of Medicine (1825, p. 105), says: "The appearances, on dissection, of those who have died of small-pox are confined, as far as my observation extends, to the mucous membrane of the trachea and to the pleura. *The abdominal viscera appear to be singularly exempt from the influence* of the variolus virus. No vestiges of pustules have ever been traced in the cavity of the abdomen." The same statement is repeated in his later work on "The Exanthemata" (1843).

The alvine flux, spoken of by Dr. Murchison, is only an *occasional* symptom of small-pox, both in the human subject and in sheep. *It may be said to be characteristic of Cattle Plague;* for it is in the alimentary tube chiefly that the gravity of the disease exists; whereas in small-pox the respiratory apparatus is more affected. According to Dr. Gregory, "those who die in the first week of small-pox generally succumb to the acute malignancy of the disease, but there is no marked lesion; in the second week, to affections of the larynx and trachea; in the third and fourth weeks, to pleurisy and pneumonia, laryngitis effusion into the chest, gangrene of the skin, debility, sinking, &c."

In most cases of small-pox, as all medical practitioners know, the early eruption can be distinguished, on passing the hand over the skin (without using the eyesight), by the hard "shotty feel" of the pimples; but in Cattle Plague no such hard elevated spots exist, in any stage of the disease. In several cows that I have seen, many parts of the skin, including a portion of the udder in some, were covered with a scabby eruption; but there were no distinct pustules or vesicles; nor were the crusts isolated or prominent. It may be said, and perhaps with some truth, that in hairy animals, like the cow, the disease (small-pox) may assume a different character, and be less apparent in the skin. Virgil, at the end of the third Georgic, and many of the older writers, as I shall have occasion to show in a future letter, describe a cattle-murrain that has more resemblance to small-pox than the present Cattle Plague; and recently, as recorded in the *Veterinarian*, by Mr. Thacker, V.S., a cattle-murrain has existed at Kurnool, India (June, 1864), but of a much less fatal character than that now prevailing in this country, in one form of which the animals break out in pustules; but this form of the disease was not seen by Mr. Thacker.

But let us look to the small-pox in the sheep, which is very common on the European Continent, and has been brought, as before-mentioned, three or more times to this country. The best and most comprehensive account of this disease, and of many matters relating to inoculation and vaccination, are given by Hurtrel d'Arboral, 1822: *Traité de la Clavelée, de la Vaccination et de la Clavelisation des Bêtes à Laine;* Paris.

He says (p. 294) that "cow-pox inoculation is an insufficient guard to sheep, although three-fourths inoculated took the vaccine disease." He, moreover, asserts that "sheep-pox inoculation does not prevent small-pox in man." "Inoculation," he says, "produces a mild malady, and frees the whole flock in forty or fifty days from the danger of natural infection." But let me quote a more recent writer, Professor Simonds, in the Essays already alluded to, 1848-1863:—

"In sheep small-pox the skin is hot, with red elevated patches and nodules, especially inside the arms and thighs, but covering the whole body, although less intense in other parts, some of the elevations presenting a tubercular, warty appearance; the various stages of papulation, vesication, suppuration, and crustation appearing as in man, as well as the pocked faces and cicatrized surface of the skin.

"As regards the pathology, the mucous membranes of the respiratory system are chiefly affected, and in the digestive system there are few traces of morbid action."

Professor Simonds in 1864 came to the same conclusion that Hurtrel did in 1822—"that vaccination is useless, that inoculation with sheep-pox matter is the best safeguard, reducing the mortality to 5 per cent., and that sheep-pox is not conveyed to man by inoculation, as shown by the experiments of Messrs. Ceely and Morson."

There is one matter of great interest connected with this question, viz., the effect of the Cattle Plague upon the fœtus *in utero*. In two instances I have examined the fœtus of the cow at an early* period of gestation, the cows having died of Cattle Plague. In both fœtuses the blood was so fluid that the skin appeared to be injected, all the reteform arrangements of the capillaries being very distinct. No papulæ, spots, or ecchymoses were perceptible. In small-pox, as is well known, the disease is often communicated to the fœtus. and abortion frequently occurs. I have reason to believe, although the evidence I possess is far from complete, that cows in calf more frequently recover from Cattle Plague than oxen.

I have recently seen eighteen cows in calf that have recovered from this disease, and only two of them had "slipped their calves." What the ultimate result will be remains to be seen.

I have not now time for research; but it is scarcely likely, I think, that vaccination and small-pox inoculation for Cattle Plague have escaped the notice of the Russians, Germans, French, and other people. There is, however, one fact tolerably well-established—that whilst in human small-pox and in sheep-inoculation a milder disease is produced, inoculation with the virus of Cattle Plague *rather increases than diminishes the severity of the attack.*

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* One weighed 3½ oz., the other 28 oz.

I am obliged to reserve my comments upon other statements in Dr. Murchison's report, that admit, I believe, of a different interpretation, for a second communication; but, my Lords, if the plan I suggested in my second letter (September 30th), of forming one large Experimental Hospital by the Government had been carried out, all these doubtful matters relating to the identity of small-pox and Cattle Plague, and a hundred others, might have been determined, and the country probably have been saved millions of money.

I copy the extract above alluded to. To many the purport of my letter is already sufficiently Quixotic; but there is one matter that I cannot refrain from mentioning, viz., the effect of inoculation (under guarded circumstances) of the virus of variola,* cow-pox, typhus, measles, and scarlatina from the human subject, as prophylactics, or as remedial measures. It is surely worthy of trial. *One of the direct scourges of humanity has been kept in abeyance by the introduction of vaccine matter from the cow into the human body.*

In conclusion, I may remark that there is a great distinction between alliance and identity; Cattle Plague in some respects is allied to malignant scarlet fever, but I infer that Cattle Plague (so called) is not identical with small-pox; that, as I have explained in my sixth letter, it is an exanthematous disease *sui generis*, and that the most characteristic name for it is, the malignant spotted fever (*Febris maligna guttata*).

I am, my Lords, yours respectfully,

EDWARDS CRISP, M.D.

Beaufort-street, Chelsea, Jan. 4th, 1866.

Remarks.—This letter needs but little comment. I was one of the first to expose the fallacy of this small-pox theory, and the result has fully proved the correctness of my views.

LETTER IX.—KILL AND COMPENSATE.

TO THE RIGHT HONOURABLE THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—The title of my letter may appear strange to many now that we have a supposed preventive for the Cattle Plague, in the shape of cow-pox matter; but, my Lords, assuming that this virus may act as a preventive in some instances, is it likely that of the 8,000,000 of cattle in this country that one-fiftieth part of them will take the vaccine disease, or that they will be properly vaccinated? If we wait for the realization of this hope I, fear we shall be leaning on a broken reed! As in the case of the homœopathic experiments valuable time will be wasted, and the disease greatly spread by the attempt to cure it, or to prevent its occurrence by ineffectual means. *Kill and stamp it out, and then prevent its occurrence in future!* It must not be supposed from this that I think treatment ineffectual; on the contrary, I believe *that a great many animals may be saved by judicious treatment;* but, if in attempting to cure *one* you endanger the lives of thousands, the best policy is to prevent the extension of the disease by the pole-axe. I am afraid, now that the disease has been allowed to spread to so fearful a degree, that isolation and prevention of the movements of animals will alone be ineffectual. Better make a great sacrifice at once (as I have before said), than risk the loss of our best stock, that cannot be replaced by foreign breeds. But before entering more fully into this matter let me again speak of the identity of small-pox and Cattle Plague in reference to Dr. Murchison's communication. Since my last letter was written I have seen several cows that I have every reason to believe have had cow-pox, some of these had Cattle Plague in a severe form, and others died. But let it not be supposed that I am opposed to vaccination. I have advised all to vaccinate as soon as possible, and continue it until this matter is fully determined. Let us not sit with our hands folded whilst the Government is asleep. I believe that small-pox and cow-pox are not identical, and that the homœopathic assertion that like cures the like, in this instance, is without foundation. Cow-pox, I believe, originated from the greasy heels of horses, as supposed by many, and as proved by the experiments of Sacco and others; and this leads me to recommend that in the *absence of vaccine virus* the matter from the "greasy" heels of horses should be at once used.

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* The first two inserted in the manuscript letter to the Lords of the Privy Council, not in the *Mark Lane Express.*

I have moreover reason to think that many skin affections will produce, by inoculation, an eruption simulating both cow-pox and variola; but this will be better discussed in my letter on the resemblance of the diseases of man to those of the lower animals.

Again let me ask, Is this plague small-pox? My further researches, my Lords, tend to confirm the correctness of my first opinion that this is an eruptive disease of a specific kind, and the asserted resemblances to small-pox are far-fetched and imaginary. In answer to questions to gentlemen in various parts of England, I find that in the vast majority of cases no eruption has been observed. On Monday last, January 14, I examined two cows that were killed (as reported at the Pathological Society of London, January 15), one thirty hours after the first appearance of the disease, and the other seven weeks after its occurrence. In neither of these could any eruption be discovered on the skin. I have examined lately a mufflon (*Ovis musmon*) that died of Cattle Plague, so-called; and on this animal no trace of eruption was visible on the skin; and the same remark will apply to the 28 sheep I examined in Norfolk and Suffolk. The tanner might have discovered *spots*, but his aid is not necessary in detecting small-pox in sheep.

I again beg to direct your Lordships' attention to one fact that explains many of the morbid appearances in this disease, which I have mentioned in my fourth letter. So fluid was the blood in these sheep that in the dead animal the uppermost eye was bloodless, whilst that nearest to the ground was highly congested; that the congested appearance of the vessels in the lining membrane of the trachea, which many would call inflammation, could readily be removed by pressure with the finger, on the removal of which the vessels would refill. This circumstance, I think, throws much light upon the pathology of the disease. Not only is the blood fluid, but the coats of the vessels lose their tone, and hence the tendency to congestion, ecchymosis, and the escape of the vital fluid from the capillary vessels. That there is a scabby eruption on the skin in many cases, both in cows and oxen, I have often witnessed, as stated in my last letter, but I fail to see the resemblance to small-pox; and this leads me to notice an important fact that, as far as I know, I was the first to notice (Pathological Society, Oct. 17, 1865). Men engaged in flaying animals, and in removing the intestines, have often upon their arms and thighs an eczematous eruption, which begins with small red pimples. These vesicate and desquimate, and are attended with great itching. They are chiefly present where the acrid matter is applied. These men are in the habit of placing the knife between the thighs, and hence the presence of the eruption on this part. One man escaped for a long time, but recently, after examining a cow in a very malignant form of the disease, the eruption appeared on his arm and other parts. I have had this eruption on my own arm.

This fact may prove hereafter of more significance than at present appears. But to return to Dr. Murchison's communication. A great mistake is made in the assertion that "small-pox and rinderpest are propagated by inoculation, and that this can be said with certainty of no other human malady than small-pox." Measles and some of the other exanthemata are easily communicated by inoculation, as mentioned by Dr. Gregory in his work on the exanthemata, 1843, p. 114. Dr. Katona inoculated 1,112 persons for measles, and failed only in 78 cases (7 per cent.), and all the inoculated recovered. The exemptions spoken of by Dr. Murchison in infected herds of cows are met with in all contagious diseases, both in man and in the lower animals. Some are apparently proof against the poison of small-pox, typhus, scarlatina, and measles. Again, the Cattle Plague in India, Dr. Murchison states, "has produced small-pox by inoculation;" but how happens it that, before the introduction of vaccination, in India, Italy, England, and other countries, small-pox has never been communicated to man by animals affected with Cattle Plague? Is it not likely, as supposed by Dr. Macpherson, that the native vaccinators practised some deception? or is not my own supposition before expressed probable—that many pustular and vesicular diseases of the lower animals will produce by inoculation local and general affections simulating both small-pox and cow-pox? Dr. Murchison in his second letter quotes Mr. Macpherson, of Bengal, and says, "he inoculated from diseased cows, and an eruptive complaint of a true variolus nature was produced;" but hear Dr. Macpherson, Superintendent of Vaccination (*Medical Times and Gazette*, Jan. 13). The (supposed) cow-pox vesicles, he says, "are earlier developed, more accuminated, soon filled with pus, and not forming scabs; they progress three or four days faster than regular vaccinia, so the use of this virus was abandoned." Dr. C. Palmer (*Calcutta Gazette*, Jan. 17) says: "No true variola or small-pox appears in any of the descriptions of the disease;" he believes the eruptive fever is a fatal vesicular disease—*eczema epizootica.* Again, it is a great mistake to suppose that the old writers called this disease small-pox. Ramazzini, Lancisi, Layard, and others speak of the resemblance of cattle-murrain to small-pox; but, as I said in my last letter, there is a great difference between resemblance and identity.

But let us now, my Lords, again ask how we are to get rid of the pestilence? What has the waiting and patient policy of Sir G. Grey and Mr. Helps done for us? What have we gained by trusting to local authorities? and what are we likely to gain by the "hodge-podge" legislation that is at present adopted? My Lords, to men who can see a few yards beyond their noses only destruction and ruin to the agriculturists of this country, the loss of our flocks and herds, and the consequent impairment of the health and stamina of the people. The fire may be partly extinguished for a time by half measures, but I believe the remedy for the evil may be comprised in a few words —let *the Government stop all movements of cattle, sheep, pigs, and dogs; and then begin to kill and bury diseased animals, and compensate the owners.* I believe there is not a man in the country who will not benefit by this course; and if his taxes are a little increased he may grumble in the English fashion over his roast beef which he is not likely to get if the present waiting policy of the Government be continued.

I am, my Lords, yours respectfully,

EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, Jan. 17th,* 1866.

P.S.—From a large number of answers to questions that I have received from various parts of England, the disease has been greatly increased by the attempt to cure it, and the statistics of Scotland, Norfolk, Yorkshire, and other places I think fully prove this; but why are all these important facts withheld, I ask, by the medical and veterinary advisers of the Privy Council?—with them all is silent as the Inquisition. What important and practical information might have been elicited and made public ere this! We have only the old story of the "Revel" cargo, and oft-told history of the plague. What is the Royal Agricultural Society doing, we may well ask?

Professor Gamgee, at the Midland Farmers' Club, December 11, 1865, said "that to stop the cattle trade of this country was impossible; but it might be regulated; that if they tried to shut every fair and market they would fail." In his comments in the *Field*, November, 1865, he expresses nearly the same opinions. I agree with Mr. Gamgee respecting the importance of killing all affected cattle and sheep, but this *alone*, I believe, is not sufficient; all fairs and markets must be stopped likewise; indeed, the efficacy of the plan has been fully proved.

Remarks.—It must be remembered that if my plan and that of others of stopping all movements of oxen and sheep by rail and road, and killing all foreign animals at the ports of landing, had been adopted at an early period, that the stringent measures recommended in this letter might not have been necessary. In the Islington market I believe that I have seen a hundred Dutch oxen exposed for sale, and all in the first stage of Cattle Plague. Professor Gamgee advised, at the commencement of the outbreak, that all affected animals should be killed, but he did not recommend that fairs and markets and the movements of oxen should be stopped. I have quoted his remarks from the *Field.* I may here observe that I entirely disagree with the opinions of Mr. Bright, Mr. Stuart Mill, and others, that those whose cattle are killed by order of the Government are not entitled to compensation, and I see no analogy between the cotton famine and the Cattle Plague. If a man's property is destroyed for the *public good*, he should be fully compensated. This "penny wise and pound foolish" policy is well shown in the present price of meat, milk, butter, cheese, and many other articles of diet. The public have paid dearly for their whistle.

LETTER X.—HOUNDS AND HUNTING.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—Now that the small-pox and vaccination bubble has burst, and the theory of the identity of variola and Cattle Plague is found to be untenable, I need not prolong the controversy, and trouble you with a third letter upon the subject. I will, however, make an addendum to my seventh letter—"Dogs and Disinfectants." I hoped, ere this, my Lords, that the masters of hounds, and those following the manly and national sport of hunting, would have become convinced that there is but little chance of our getting rid of the Cattle Plague whilst nearly two hundred packs of hounds and thousands of horses are weekly, and almost daily, traversing the country. I mentioned, in the letter alluded to, that her Majesty's staghounds were to meet within a hundred yards of a farm where several cattle were suffering from the plague; and I naturally assumed that such an occurrence would not have been allowed by those in authority, unless they believed that the pestilence could not be disseminated by this means. But let us, my Lords, inquire more fully into this matter; and as circumstantial evidence is sometimes strong enough to hang a man, I hope, by a like chain of probabilities, to show that it is more than probable that, in some instances, the fomites of this plague have been carried by hounds and horses from infected to healthy districts; and let me again repeat the fact that I have so often enumerated in these letters—*that this disease is so insidious, and the symptoms so inappreciable in the incipient stage*, that the excretions of cattle that are *apparently* healthy may readily be the means of conveying the murrain. In conversing with many sportsmen upon this subject, the general answer is, "Well, I don't see how the plague can be carried by this means." And the learned editor of a celebrated sporting journal (the *Field*), in a recent number (Jan. 6th, p. 11), observes:—"Theoretically, it is possible that the feet of hounds may carry the disease from one field to another; but, practically, every one knows that the slight stain which might be picked up would as speedily be removed by friction against the turf or soil in running the next few strides." Those who reason in this way, I am afraid, are but little acquainted with the nature of Cattle Plague, and the subtilty of its poison. I could readily quote from letters in the public journals many examples where the plague is supposed to have been conveyed by hounds, but as the occurrence of the plague in these instances may by some be thought to have been mere coincidences, I refrain from alluding to these particular cases, as they are difficult of proof. But let us confine the argument to probabilities; and let me ask, Is it likely that when the feet of horse or hound are tainted with the excrement or urine of diseased cattle, that they will lose the poison in a few strides? Is it not more probable that it sticks to the foot of the dog for many hours, and it may be days? for the structure of the dog's foot is peculiarly adapted for the conveyance of the virus. Is it likely that hounds in full cry, and when close together, could avoid this contamination? and is it not possible that the fox, whose cunning is proverbial, would select these infected spots, to arrest the progress of his pursuers, and divert them from the right track? But what are the probabilities that this poison is so conveyed? The scent from the foot of the deer is so potent that this animal may be tracked by almost any dog; but this, it will be said, is a natural secretion, and has no analogy to the poison of Cattle Plague. Let us take an artificial scent. In some parts of India the jackal is hunted early in the morning, before the dew is off the ground, the oil of aniseed, or some strong perfume, being placed upon the feet. In this country, by the same practice, any digitigrade animal may be hunted; and I question whether the scent would be lost after many hours' running. There is no reason why the odour of Cattle Plague, which is very potent and characteristic, should not likewise be retained. So peculiar is the smell, that I know of an instance in Norfolk where the presence of the plague was detected in this manner: A gentleman, who had seen much of the disease, was driving along a public road in his own parish, and, in passing a shed, he at once recognized the smell of Cattle Plague, and told the inspector, who found a cow in the last stage of the disease. The owner, not approving of the Government plan of killing without compensation, and, adopting the motto of a late duke, "*that a man might do what he liked with his own*," had concealed the fact from the inspector. In another instance, diseased animals, when the wind was favourable, could be smelt at a distance of more than three hundred yards; and it is not to be wondered at that cows at this distance were soon infected.

If, then, my Lords, the smell of aniseed and other odoriferous substances remain on the feet of jackals and dogs for a long period, it may naturally be asked, why the scent of Cattle Plague poison should be more evanescent, or why the virus should be removed from the hair and pad of the dog's foot by friction or dirt? A dog may, I believe, in this way, contaminate every blade of grass he passes over. But, my Lords, it appears to me that the Government and their advisers have added another glaring act of inconsistency to the many I have already mentioned, in this matter of dogs and Cattle Plague. In the recent Council Order (January 20th), in reference to Ireland, clause 10, it is ordered that "all animals shall be prevented passing from, or as much as possible from approaching to the boundaries of such districts," &c. "12. All dogs within the infected district shall be kept shut up, or chained, or by other sufficient means shall be prevented from passing out of such infected districts." "16. No dog accompanying a drover, or of the description used by drovers or persons in charge of cattle, sheep, or swine, shall be brought into any part of Ireland by any person if the last place on land from whence such dog shall have been brought shall be any part of Great Britain." If such restriction as regards dogs are necessary for *single* dogs in Ireland, why, it may emphatically be asked, are packs of dogs allowed free liberty in England? Surely, my Lords, to quote a vulgar proverb, "this is straining at a gnat and swallowing a camel." If a law is good for Ireland it should be equally applicable to England, where there are many districts not yet affected with the plague; although if the present waiting policy be continued, there is but little chance of their remaining so. I could give a thousand examples of the folly of trusting to local authorities; but let me mention one that is especially applicable to this subject. Dogs and Hunting.—According to the *Oswestry Advertiser* "the Board of Guardians of Nantwich signed a memorial requesting Lord Grosvenor not to give up the hunting, and the largest sufferer by the plague seconded the resolution. The chief argument used by the memorialists was the supposed fact that hounds did not convey the disease so much as butchers' and other dogs." The evidence I have already adduced I hope is sufficient to refute this fallacy; but, assuming the statement of the Oswestry Guardians to be correct, why, in the name of common sense, should *any dogs* be allowed to convey the disease? As one scabby sheep may affect a whole flock, so may one dog be the means of contaminating all England. But let me again endeavour seriously to impress upon your Lordships the utter impossibility of exterminating this murrain unless uniform and energetic action on the part of the Government be quickly adopted. What, my Lords, does the history of the plague in *all countries* teach us? What is the experience in Aberdeenshire? What have the counties gained where globules and other forms of quackery have been largely tried? But hear the evidence of M. Bouley, who was sent to England by the Emperor of the French at the commencement of the Cattle Plague, and who had a good opportunity of seeing the laxity and inefficiency of our system of medical

Government. In *L'Union Médicale*, January, 1866, p. 18, is an account of M. Bouley's paper at the Imperial Academy of Medicine, Paris, on the deaths of the animals at the *Jardin d' Acclimasation* of Cattle Plague. In this communication, when speaking of the plague in England, he is not very complimentary to the Government (medical and otherwise), to the press, and to the people of this country, as regards this particular question; but to show fully the advantage of the pole-axe treatment he quotes Belgium, where the disease was quickly stopped by the loss of 600 animals only, and in his own country (France) it was extirpated by the sacrifice of only 43 oxen; and yet, after these well-known facts, we have Mr. Helps telling the Commissioners, in his evidence (question 1,863), "that we cannot say that the efforts of foreign countries in exterminating the disease have been wonderfully successful, except in Prussia."

My Lords, to use the expression of poor Lincoln, I keep "pegging away," and I have the satisfaction of being told that my letters are *now* first sent to your Lordships, and then to the Commissioners; instead of being placed, as explained in my second letter (September 30th), in the hands of Professor Simonds, or in those of the *Surgical* officer of the Privy Council. That my feeble efforts to assuage the stay of this pestilence have remained unheeded, the statistics of the increasing weekly mortality from this fearful plague fully testify.

I am, my Lords, yours respectfully,
EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, Feb. 2nd,* 1866.

Remarks.—If the Cattle Plague should prevail next winter, I hope that this question will not be left to the decision of masters of hounds in infected districts. In some parts of Cheshire and Fifeshire the hounds were stopped, but this was an exception to the general rule. As will be seen in the *Journal of the Royal Agricultural Society*, 1866, part i., p. 276, and *Mark Lane Express*, February 27, 1866, Professor Simonds, the Government authority, "thought that the disease was conveyed by pigeons and starlings, but he had no proof that hounds and horses could convey it; and if it were shown that hunting was a means of conveying it, the Lords and gentlemen would give it up." How any one can conceive that pigeons and starlings can disseminate the disease, and that a pack of hounds and five or six hundred horses in an infected district will not carry it surpasses my powers of comprehension. I have as much proof that hounds and horses convey the disease as Professor Simonds has that pigeons and starlings carry it; the only proof obtainable being that in Cheshire and other places the plague has appeared after the presence of these animals. But have we, let me ask, the same amount of proof respecting the virtues of disinfectants and fifty other things that are assumed to be facts?

LETTER XI.—THE "CATTLE PLAGUE," AS SO CALLED, IN SHEEP AND IN OTHER ANIMALS.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—In a former letter (Oct. 31st, 1865) I fully described the so-called "Cattle Plague" in sheep; and I was not content with making one examination, but I carefully inspected a great many sheep, that I might fully convince myself of the nature of the disease. I had been, moreover, for many years specially investigating the diseases of sheep, with a view to throw light upon human pathology and treatment, so that I considered myself competent to form a correct opinion. Notwithstanding the disclosure I made upon this, as well as the publication of the previous labours of Professor Simonds, the vast number of agriculturists, landlords, and tenants, are disposed to believe that sheep will not take the plague—an inference that has been greatly strengthened by the error circulated by the Privy Council (August 3rd), "*That the disease especially belonged to the ox tribe, and that it has never been known to attack any other domesticated animal.*" For a short period (supposing this statement to be correct) I laboured under this error; and in the programme in my first letter, one of the lines of investigation chalked out is the peculiarities in the structure of the bovine family that especially render them liable to be affected by this mysterious poison. I soon found, however, on consulting foreign authorities, that this plague had affected sheep in many countries, although its ravages among this class of animals were comparatively light. The Norwich Committee, composed of medical and veterinary practitioners, fully confirmed the correctness of the opinion expressed, first by Professor Simonds, and afterwards by myself, that sheep in this country were affected with "Cattle Plague." But to make the matter more certain, and to place it, as might be thought, beyond doubt or cavil, sheep were inoculated from the ox, and the ox from the sheep, and the disease was thus propagated. As I stated in the letter alluded to, I saw a sheep at Norwich when alive, that had been inoculated from the ox; and when the animal died of the disease, I had an opportunity of examining it after death, and I believe, at the Veterinary College, experiments of a more conclusive nature have been tried. It may be thought unnecessary to go over this ground again; but, my Lords, the question is of so much importance as regards legislation in this matter of Cattle Plague, and so much ignorance exists respecting the occurrence of this disease in sheep and in other ruminants, that I cannot, I think, better employ my time than in endeavouring to dispel the prevailing error. Notwithstanding the evidence I have quoted, learned lords, magistrates, and their satellites, are constantly affirming that it is questionable whether this plague can affect sheep; our journals teem with such statements. In some counties and districts the movements of sheep are stopped, whilst in others they are free and uncontrolled, much often depending upon the assurance and ignorance of the most loquacious speaker among the magistrates. My Lords, if, as I have hinted in a former letter, London were on fire in almost every part, should we trust for the extinction of the conflagration to local authorities? Should we employ men for its annihilation who are utterly ignorant of the use of the fire-engine? Should we have quarts, gallons, or tons of water, pumped upon burning houses according to the whims and fancies of the different vestries of the metropolis? And yet, my Lords, this is nearly the condition of the state of things in England in relation to the extirpation of this pestilence.

Our neighbours on the opposite side of the channel say that "England is the paradise of quacks," and the attention paid to the lordly and the ignorant during this outbreak fully bears out the correctness of this assertion, a matter I shall fully discuss when treating upon this pretended science of homœopathy. Mr. Campbell, of Buscot Park, recently (January 23rd), at the Berkshire meeting, told those present that Mr. Swain's experiments in Edinburgh proved "that sheep are not liable to the disease;" but it so happens that the Edinburgh experiments prove just the reverse. In the *Times* (January 6th) we are informed "that it is extremely doubtful whether sheep took the plague, although they might carry it about." Lord Walsingham, in Norfolk, has lately expressed the same opinion; and one honourable member of the Lower House—then a disbeliever of Cattle Plague in sheep—when the question was discussed, remarked that two "shepherds of eminence, who observed purple spots upon the second stomach of a sheep which they killed, were prepared to swear that they had seen such symptoms twenty years before."

We should like to see these shepherds of eminence. The generality of shepherds, as I have had abundant opportunities of knowing, are the most ignorant, credulous, and bigoted set of men among the peasantry of England; the greater proportion of them, thanks to the orthodox views of our Council of Education, can neither read nor write. Unfortunately for these eminent shepherds, however, purple spots are never seen on the second stomach in Cattle Plague.

It is painful, my Lords, to listen to such twaddle as this; but unfortunately this is a fair sample of the kind of opposition that scientific men have met with in investigating this disease. The horse-leech, the quack, and charlatan, too often utterly and entirely ignorant of the structure of the animals they profess to cure, have been listened to, whilst the statements of men who have worked patiently and laboriously have been disregarded. But let me, my Lords, give additional evidence of the liability of other animals besides the bovine race to take this plague. Up to the present time I know of eleven goats that have taken the plague, and all of them died. I believe that the goat, from its fondness for cattle, is more liable to be affected with the disease than the sheep, and that with this animal it is more likely to prove fatal. I had often publicly stated that I believed that there was not a *ruminant* at the Zoological Gardens that might not be affected with this murrain, and the correctness of my opinion has been singularly verified. Since this I have examined a zebu (*Bos indicus*), a mufflon (*Ovis musemon*), that died of the plague in this country, and I know of three other species of ruminants (a deer and two species of antelopes) that have succumbed to it. None of these animals were at the Regent's Park Gardens, but at this establishment I have reason to believe that other ruminants have also fallen victims to the plague. But let me briefly recount the outbreak of the plague at the Jardin d'Acclimisation, Paris, narrated by M. Bouley, the Veterinary Professor at Alfort (*L'Union Medicale*), January 6th, 1866 ; it affords a good and practical contrast to the different methods of dealing with the disease in France and in this country. Two gazelles were sent by a London dealer to the Paris gardens in November last. Ten days after their arrival one of them sickened with the plague. The next day the other was affected, and the disease was communicated to forty-three different animals—six zebus* (*Bos indicus*), goats, antelopes, stags, Virginian deer (*C. Virginianus*), musk deer (*Moschus moschiferus*), yack (*P. grunniens*), aurochs (*Bos urus*), and two peccaries (*Dicotyles*). One stag was entirely removed from the other animals, but the infection was carried by the keeper. The only animal—a very valuable one—that was saved was the male auroch. Holes were dug, and all the diseased animals that had not died of the plague were killed and buried, and the murrain thus stamped out. I was led to hope that ruminants were the only class of animals likely to be affected with this disease ; but, according to M. Bouley, two peccaries—animals whose visceral anatomy has a great resemblance to that of the pig—also died of what he calls contagious typhus (*Typhus contagieux*). In one, intestinal inflammation was intense ; and in the other peccary there was a confluent eruption like small-pox. I hope that M. Bouley was mistaken in this matter, because if the peccary can take this fever the pig probably will not be exempt, so that this is a question of some interest and importance. Pigs have often been with cattle affected with the plague, and have eaten their excrement ; but they have escaped the infection. I have, however, recently examined pigs that have been near to infected cows, and were thought to have died of the rinderpest. I have also seen several pigs that were supposed to be dying of the plague. I will not enter into this question on the present occasion, but I enclose drawings illustrating the morbid appearances of this disease in the pig ; and it is not to be wondered at that M. Bouley, if he saw the same disease in the peccary, likened it to small-pox eruption, for it bears a much greater resemblance to this exanthem in the intestines of the pig than anything I have seen in ruminating animals.

I am sorry again to differ from Dr. Budd of Clifton. I believe that this affection in the pig is not analogous to the typhoid fever in man.

I have examined several rabbits sent to me that were supposed by some to have died of Cattle Plague. One gentleman, who has a warren of 3,000 acres, has lost 20,000 in three years ; but I reserve this subject also for a future letter.

Surely I have said enough, my Lords, to convince any man gifted with ordinary reasoning powers that sheep are liable to Cattle Plague. As I have asserted in my former letters, they are not so likely to take the infection, nor is the disease in them so fatal as in the bovine species. But let me point to some of the outbreaks of Cattle Plague among sheep in this country. In addition to the example first mentioned by Professor Simonds (September 25) of Mr. Temple's sheep at Blakeney, Norfolk; of Mr. Harvey, of Crown Point, Norwich; and of Mr. Hicks, of Hinney, Suffolk—the two last described in my fifth letter of October 31st—I add the following:—According to the *Marlborough Times*, Mr. Tarrant, of Mildenhall, Wiltshire, had 109 sheep from Bristol fair; 49 died of the plague, as verified by Mr. Duck, veterinary surgeon. At a meeting of the farmers of the district, it was resolved to kill the remainder, and compensate the owner. The carcases of the sheep were buried in lime. Mr. H. Overman, of Edgemere, Brandon, Norfolk, informs me that he has "seen the plague in sheep on four occupations in this county;" and Mr. Hammond, M.R.C.V.S., Bale, Thetford, tells me of "two outbreaks in Norfolk, besides that of Mr. Temple's" (Mr. Savoy's of Sparham, and Mr. Wilson's of Moiston). It is probable that Mr. Overman and Mr. Hammond may allude to the same cases. Mr. Thurston, M.R.C.V.S., Freshingfield, in reply to my question, says:—"Upon a farm in my district, where the cattle have been dying of the plague, a quantity of sheep upon the same premises have also been dying from Cattle Plague. Sixteen sheep have died these last eight days, and there are eleven more now suffering with the same symptoms as the cattle." Mr. Vine, M.R.C.V.S., Lewes, Sussex, replies:—"I have had the disease in two lots of sheep." Mr. Hazell, M.R.C.V.S., Great Bromley, Essex, has seen sheep affected. Mr. Broad, Bath, refers to the outbreak of sheep plague near Bath, which I have alluded to in my seventh letter. In this attack, when Mr. Freeman, surgeon, made his report (*Medical Times and Gazette*), 26 sheep had died of plague out of 70, and 2 oxen had also perished.

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* The *Times* correspondent stated that six *zebras* were killed ; hence the mistake in my seventh letter.

I have reason to believe that a large number of sheep have died of this murrain in various parts of England, and especially in Scotland, but it has not been recognized, and that I shall in a few weeks make large additions to the cases I have already collected.* On Wednesday† last I received a communication from Mr. Barthropp, of Hacheston, Suffolk, secretary to the East Suffolk Cattle Plague Association, telling me of the existence of sheep plague at Mr. Denny's, Battesford, Needham Market, Suffolk. I left yesterday (Feb. 8) for Needham, and was fortunate enough to see Mr. Vincent, the veterinary surgeon, who had attended the animals, and who had reported to the Government that they laboured under Cattle Plague. I saw several sheep in various stages of the disease; and Mr. Denny was kind enough to have one killed for me, which I inspected with Mr. Vincent. I need scarcely repeat the symptoms and morbid appearances that I have so fully described in my fourth letter; but there was no question about the nature of the disease—dry nose at first; then discharge from nostrils and eyes; congested rectum and vagina; dull, anxious countenance; drooping of the ears; a disposition to lie down; often a peculiar cough; groaning and grinding of teeth; non-rumination, and frequent purging of dirty-coloured mucopurulent matter, with occasional twitchings of the muscles in some cases. In these sheep there was no perceptible eruption in any part of the mouth or skin; nor have I seen this in any sheep that I have inspected, although spots are seen on the hide sometimes during the process of tanning. The chief morbid appearances—fluid, or semi-coagulated state of blood, a general redness or spotting of the fourth stomach, with a red, streaky state of many parts of the intestinal tube, with a pappy matter between, as described in my former letter. On the 15th December the Plague broke out among Mr. Denny's eighteen oxen, of which seventeen died. The hundred sheep (hoggets) were close to these oxen—so close, indeed, that their noses nearly touched. On the 15th of January the sheep became affected, and yesterday thirty-five had died; and probably about half of them will be lost, for several were ailing, but a great many were convalescent.

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* It must not be supposed that I take cattle fees, or that I infringe upon the province of the veterinary surgeon. I pursue this investigation without hope of reward.

† I learn from Mr. Barthropp, that since my visit Professor Simonds and Mr. Shorten, M.R.C.V.S., of Ipswich, have seen these sheep, and pronounced the disease to be similar to that of Cattle Plague.

I mention this case, my Lords, to show the importance of separating diseased sheep from healthy oxen, and more especially to point out the necessity of including sheep among the animals that should not be moved alive, unless under special circumstances. In my sixth letter, on the Report of the Royal Commissioners, I have pointed out the inconsistency of stopping the movements of cattle, as advised by the majority of the Commissioners, and of allowing sheep to be driven along public roads.

We have a desperate enemy to contend with; and our means of subduing him have been about as effectual as the grass binding of the Liliputians was to the subjection of Gulliver. The famous Hydra of old had a hundred heads; but the demon of Cattle Plague has now, in this country, many thousand; and unless they are simultaneously decapitated, there is no chance of crushing him. The task is an herculean one; but the longer it is deferred the more difficult it will become.

I am, my Lords, yours respectfully,

EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, Feb.* 9.

P.S.—As the Government, on Monday, Feb. 12th, will introduce a bill for the extermination of the Cattle Plague, it will be seen that this matter of "sheep plague" is one of *great importance.* The concealment of this disease in sheep from the weekly returns accounts, I believe, in a great measure for the ignorance that generally prevails on the subject.

Remarks.—I can now mention a fact respecting these antelopes sent to Paris that I could not at the time make public. Mr. Jamrack, the extensive dealer in foreign animals, sent me a dead mufflon to examine. I soon discovered that it died of Cattle Plague. Mr. Jamrack, before I communicated the circumstance to him, had sent the two antelopes to Paris, supposing that they were perfectly healthy. Mr. Jamrack's animals were next door to a cow-shed where several cows had died of the plague. A short time after this I examined a zebu that at another dealer's had died of Cattle Plague. As far as I know, the mufflon is the first foreign ruminant that is recorded to have died of Cattle Plague, in this or in any other country. I believe that the disease in the peccary was not Cattle Plague, as described by M. Bouley, but the so-called typhoid fever in pigs. I have seen the same appearances where pigs were supposed to have died of Cattle Plague, and I believe that ruminating animals only will take the disease. Recently, in the *Field*, it is stated that two elands had been attacked with Cattle Plague in Cheshire, and that the male had died. Up to the present time there are a great many ignorant people who maintain that sheep are not affected with Cattle Plague. It is useless to argue with men whose assurance and presumption is even greater than their ignorance. The propagation of such a doctrine, and the absence of sheep returns until recently by the officials of the Privy Council, have been the means of spreading the disease to a great extent among oxen. In the last return (Aug. 25), it is stated that 6,625 sheep have been affected, and that 102 were attacked during the week ; but I believe that more than double this number have had the plague, and the disease has not been recognized or purposely concealed, under the pretended belief that sheep cannot take this murrain. In the House of Commons, Tuesday, February 21st, three members stated that sheep were not subject to Cattle Plague, and the members present appeared by their silence to believe in the correctness of this opinion, so it was decided that sheep might be driven along a public road. In the return ending Sept. 1st, 206 sheep are reported, and only 99 cases in bovine animals.

In estimating the value of these letters, the reader is requested to look to their dates, to the date of the various reports of the Commissioners, and to the orders of the Privy Council.

LETTER XII.—ON THE HISTORY, TREATMENT, AND FUTURE PREVENTION OF CATTLE PLAGUE.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—I need not say much about the history of this pestilence, as the subject is nearly threadbare; but let me, in a few words, touch upon a few of the leading facts.

The Cattle Plague, as far as we can learn, has always existed in the Asiatic Russian Steppes, extending into Hungary, Poland, and European Russia; from which countries all the European outbreaks can be traced. It made its appearance in Italy in 1709, in the neighbourhood of the Po. Lancisi and Ramazzini, in their works, *De Bovilla Peste*, 1711, and *De Contagiosa Epidemica*, 1712, have both given a good account of the plague. The disease made its way from Italy, through the Netherlands to England, in 1714-1715, where it continued, chiefly in London, for a short time. Mr. Bates, Surgeon to the King, Phil. Trans. Nos. 1818, 1871, gives an account of a contagious disease in milch cows which commenced, July, 1813, at Islington, and he appears to have had a better notion of the nature and malignancy of the affection than many of our modern writers. He says: "Kill and burn all, smoke houses and sheds with pitch, tar, and wormwood;" and he makes the following significant remark, equally applicable to the present time: "Cowkeepers will not own the disease, nor was there ever wanting one or other who gave them hopes of a cure"!

In 1745, the plague again appeared in London, being imported from Holland by means of two calves that were sent to Poplar. It continued in this country from 1745 to 1757; several accounts of it will be found in the *Gentleman's Magazine* between these dates. Dr. Brocklesby, in his book on the Mortality prevalent among horned Cattle, 1746, has described the disease, and Layard, in his "Essay On the Contagious Distemper among Horned Cattle," has given a good account of the plague, 1757.

A partial outbreak again occurred in 1769, and lasted about three years, Hampshire and Banffshire being affected about the same time. The plague was introduced into the latter county by hay imported from Holland. Other slight outbreaks are said to have occurred, but the correctness of this statement is doubtful. Let me quote a few of the Orders of Council, 1746, "Compensation at the rate of 40s. per head, to be given for cows and oxen—for calves 10s. Infected beasts to be shot, their hides slashed and buried; entire herds to be divided; animals to be examined on the public roads." What a lesson does the following teach us: "The disease was extinguished in many counties but lurked in others where the local authorities had been lax in looking after the execution of the order." In addition to the essays I have named, those who are curious in these matters may consult the works of Lobb, Lanzoni, Vic d'Azyr, Paulet, Billard, Vesoul, Weiss, Besançon, Bunna, Camper, Hering, and Youatt. The more recent British writers are too well known to need mention here, and the third report of the Commissioners should be referred to by all who require scientific information.

I now come to the history of the present outbreak, which, as is well known, is involved in some little obscurity. As I have said in my sixth letter, I have no doubt but that it was introduced by the *Revel* cargo, and that several cases had occurred during the twenty-three days which elapsed between the introduction of the Russian cargo and the first case at Islington, on the 19th of June, 1865. To show how little was known of the disease, it is stated, on the 24th of July, more than a month after the outbreak, in the *Veterinarian*, p. 22, of which Professor Simonds is one of the editors, that *"a fatal bovine disease of an uncertain character had appeared."* I need not trace it from the Metropolitan Market to Surrey, Essex, Sussex, and other places, as its progress is now too well known; its spread by means of fairs and markets, the driving of sheep and cattle along public roads, and by the dissemination of manure and skins, and the introduction of Dutch cattle, I have described in my former letters.

Let us look to the progress of the disease for the last 17 weeks, from the 21st of April, 1866, to the 11th of August, in North and South Holland, and in Utrecht. The figures indicate the number of cases weekly:—1,102, 879, 828, 714, 401, 371, 415, 321, 294, 366, 335, 597, 526, 776, 971, 989, 1,225. So that, after 17 weeks of treatment, and of tampering with the disease by globules and other simples, the attacks in the week ending the 11th of August amount to 1,225. We may well ask when will the Dutch get rid of the Cattle Plague? In Cheshire, according to the High Sheriff's statement in the *Times*, April 25th, in five months no less than 65,000 cattle were lost. In this county, again, we had infinitesimals, vaccinators, and onions palmed upon the farmers *usque ad nauseam*, and so in Scotland, Yorkshire, and in all places where very clever people have abused the veterinary surgeons, stepped out of their province, and taken the matter into their own hands, has the plague increased. But convincing proof is given of the benefit of the stamping-out system by the weekly returns since the commencement of the disease to the present time (September 1st). The figures indicate the numbers weekly attacked, beginning June 24th, 1865, and ending August 25th, 1866:—30, 147, 575, 321, 490, 757, 1,145, 1,231, 1,175, 1,270, 922, 847, 1,354, 1,333, 1,666, 1,436, 2,364, 1,955, 2,210, 3,158, 3,761, 4,316, 5,011, 5,679, 6,988, 8,011, 8,351, 9,506, 10,922, 12,468, 13,146, 12,734, 13,397, 14,325, 15,706 (February 17th), 13,040, 9,183, 9,875, 7,871, 6,744, 6,579, 4,600, 3,764, 3,947, 3,314, 2,609, 2,776, 2,126, 1,366, 1,116, 1,004, 565, 439, 260, 313, 304, 207, 208, 221, 156, 127, 148. Sheep attacked are said to amount to 6,831 ; no less than 206 cases are reported during the last week, but I believe that, for the total, 12,000 would be much nearer the number.

It will be seen by these returns that 15,706 was the largest weekly number of attacks, and this was before the new Act in February. Since this time the disease has gradually decreased, although the occurrence of 26 cases more last week over the previous week tells us plainly that, when cattle are brought together, unless more stringent means are used, the disease may increase to a great extent ; all who return recoveries should be subjected to a heavy fine. If we take the returns for the last 27 weeks, beginning February 24th and ending August 25th, we find that 15,618 bovine animals have died, and 11,878 have recovered. Why animals should be allowed to die or be treated for Cattle Plague, I am at a loss to discover, and I ask again, when are we to get rid of this pestilence ?

Mortality of Cattle Plague.—In the first report of the Commissioners, November, 1865, it is stated from Schmidt's "Jahrbuch der Gesammten Medicin," 1865 (p. 95), that the per centage of deaths in the following countries was as follows :—Hungary, 65 ; East Galicia, 77 ; Croatia and Slavonia, 81·6 ; Military Frontier, 83 ; Moravia, 88 ; Lower Austria, 92 ; West Galicia, 94 ; Bukowina and Styria, 100. The number attacked in the last two provinces was small. From the weekly returns in this country it is difficult to form an estimate, as many are killed, some die, and others are allowed to recover. Taking the week ending February 17th, when treatment of all kinds was tried, of the 15,706 attacks 996 were killed, 10,879 died, and 2,710 recovered. In 1862, 296,000 bovine animals were attacked with plague in the Austrian dominions, and of these 152,000 died.

Up to the present time, August 30, 1866, during about 14½ months, 253,211 bovine animals have been attacked with Cattle Plague in this country. Of these, 84,620 were killed ; 124,283 died ; 33,314 recovered ; and 10,994 were unaccounted for. The estimated number of bovine animals in Great Britain (excluding Ireland), March 5th, 1866, was 4,785,836 ; of sheep, 22,048,281. Of the former the per centage of attacks has been in England, 5·861 ; Wales, 1·436 ; and Scotland, 4·481. But the above per centage will give but a very imperfect notion of the number of cattle destroyed by Cattle Plague. A London dairyman in my own immediate neighbourhood found one of his cows sick of Cattle Plague, and probably the others were all affected ; the owner, knowing that he would get no proper compensation, sent all of them to the market ; they were killed and eaten. My friend, Mr. ——, has 40 lean oxen at grass—Cattle Plague is in his neighbours' fields ; all these lean oxen are sent to market, and sold at any sacrifice, and so with thousands of others. The losses from Cattle Plague are not to be estimated by Government per centages.

Treatment.—Before I enter upon this question, let me again beg the attention of my reader to the structure of the ox and sheep, a very important matter in estimating the probable success of medical treatment. In my third letter (Oct. 7th) I have given from my own measurements the length of the alimentary canal of more than forty species of ruminants that I have dissected; and this tube, as has been seen, varies in length from 30 to 254 feet, and in addition to this there are innumerable complications in the shape of folds and villi. I have, moreover, shown that this exanthematous redness, with its peculiar eruption, not only affects this great extent of intestinal surface, but that the buccal, pharingeal, laryngeal, tracheal, bronchial, vaginal, and vesical mucous membranes are also implicated, and that the same exanthem in many instances probably affects more or less the whole surface of the body. When, in addition to this, we have a fluid and diseased state of the blood, the cessation of rumination generally, and in the ox a large quantity of dried food in the first and third stomachs, the chances of recovery, it must be apparent to all, by any mode of treatment, are very slender and unpromising.

In such a state of membrane, with a stomach so loaded, and with such a condition of blood, and often, as in Cholera, with a great loss of the epithelial covering of the intestinal villi and other parts, what does common sense dictate? To leave matters alone to a great extent, and to avoid above all things violent and irritating medicines. A pint of linseed oil at first, with gruel; hay-tea, treacle; thick beer, milk, linseed, bran, and nourishment of this kind, some of which may pass the paunch and be absorbed, thus supporting the strength until the critical period is over and the veterinary surgeon can use medicines with more effect. In spite all treatment, the greater proportion will die; and so with those animals that have had nothing done for them, as shown in my fourth letter, page 70. I could say a great deal upon this matter, if I thought that treatment *under any circumstances* was justifiable. I believe that many animals may be saved by judicious treatment; but if in trying to save one you endanger the lives of thousands it is better to kill at once. Let no one try to treat an animal in Cattle Plague; it is this system that now keeps up the disease and prevents its extinction.

For the purpose of ascertaining the effect of treatment and of other practical matters relating to rinderpest, I sent the subjoined questions to many members of the Veterinary College, to several practical agriculturalists, and to a few medical men, who had paid attention to the disease. I now beg to thank all these gentlemen for their prompt answers to my questions:—

1. Has any mode of treatment that you know of been successful?
2. Has the disease been extended in your district by the attempt to cure it?
3. Are cows in calf more likely to recover from the plague?
4. Has any eruption been observed on the skin of the diseased animals, and if so in what proportion?
5. Have any sheep been affected with plague in your district?
6. Any other practical facts, such as food, prevention, bleeding, disinfectants, &c.?

I received four answers from medical men; forty-seven from members of the Veterinary College; and twenty-three from practical agriculturalists.

I was induced to put the third question, with regard to influence of pregnancy, because I had seen about twenty cows in calf that recovered from rinderpest, and at that time only two of them had slipped their calves, although subsequently all of them aborted.

I will now, in as brief a manner as possible, analyze the evidence I obtained; my space will not allow me to quote the many valuable observations contained in the letters of my correspondents.

It must be remembered that my correspondents were all living in infected districts, and had seen much of the disease.

I take the questions *seriatim.* As regards the efficacy of treatment, all, with the exception of five, have seen no benefit from it; two of these have reported cures by stimulants, one by a powder, the composition of which is not given, and the other two do not name the mode of cure. As regards the extension of the disease by treatment, thirteen believe that it has not been extended by this means; ten are doubtful about it; and fifty-one believe that it has been increased by the attempts to cure it. In relation to cows in calf, twenty are doubtful; thirty believe that the disease is not less fatal; six think that it is; and eight suppose that it is more fatal when cows are in this condition. Of the eruption, thirty-five out of the seventy-four have not seen it; ten have seen it in a few cases; three in all instances; and the rest have not noticed it, or have not looked for it. Colonel Talbot says, "all his animals that recovered had it." Mr. Lewis, V.S., Crewe, has seen several hundred cases, and a very small proportion of them had any eruption. Mr. Bland, V.S., Boston, "has seen the eruption in the proportion of 7 to 200." Mr. Leigh, V.S., Bristol, "saw no eruption on 110 examined." I cannot help quoting a few remarks from these letters. Mr. Duckham, of Hereford, says, "Some cows are buried near to a brook; the water, I believe, became impregnated, and the result is the disease has followed its course along the stream with fearful virulence. The manure was also washed into this brook." Mr. W. Pate, of St. Mary's, Ely, "has generally found that the stock that were in the best condition and best cared for, the first attacked and the least likely to recover." Mr. Biddell, Hawkstead Hall, Bury, Suffolk, "believes that his oxen caught the disease from some that were 400 or 500 yards off." Mr. Alexander Black, North Navy, Scotland, mentions a neighbour of his who lost seventy of his oxen, and had but seven left; these were put into a shippen and left to themselves, and all recovered. As regards treatment, all the veterinary surgeons nearly are agreed that it is better to kill at once, a conclusion that must, at least, be considered disinterested; they have been lustily abused, whilst the quack and the charlatan, who promised everything and did nothing, got all the praise.

If the reader will turn to page 37, where I have given a list of medicines and external applications that have been used for the cure of Cholera, he will see that a vast proportion of them have been employed also in the treatment of Cattle Plague. Arsenic, chlorate of potash, Condy's fluid, or permanganate of potash, salt, warbena, globules, vapour bath, vaccination, onions, and chloroform have all had their brief day and their enthusiastic admirers.

In my second letter (p. 60) I was the first to mention the trial of the transfusion of blood in the case of *rare and valuable animals.* Dr. P. Smith has, of late, suggested the same thing in the columns of the *Times*, but if treatment were justifiable the general use of transfusion would be impossible. In the same letter I recommended the trial of various medicines as prophylactics, and upon this subject, as well as upon the efficacy of disinfectants, we are as much in the dark as ever. I have seen a bull that had taken hydrochloric acid for several months, and was unaffected, whilst the cattle around were dying; and I could mention many examples of the assumed efficacy of certain medicines as prophylactics, but the evidence we at present possess is entirely worthless.

Future Prevention.—Lastly comes the important question as to how we are to avoid Cattle Plague in future. I believe that our only security will consist in the establishment of dead-meat markets in all cities and large towns, and the slaughter of all foreign cattle at the ports where they are landed, unless they undergo a seclusion of twelve or fourteen days. Our recent experience has taught us a lesson that we shall not easily forget, and in all future outbreaks the plan will be to kill and compensate the owners, not for diseased cattle and sheep only, but all that have been in contact with them. The efficacy of this plan has been recently fully and practically tested in Belgium, France, and Ireland. It is difficult to say when we shall get rid of the plague; but if it should ever make similar ravages in this country, it will be the fault of the Government. An agricultural university and college, with a board of agriculture, supported entirely by the State, would form a central authority that would not commit the mistakes that have been made during the present epidemic. There should be, moreover, a chief Government inspector for cattle, sheep, pigs, and horses, with a sub-inspector for each county, so that a record might be kept of the existence of all infectious or contagious diseases, and their extension guarded against. By this means I believe the people would get a better and cheaper supply of animal food, and the country generally would be benefited. The large supplies of oxen and sheep in South America, Canada, and Australia, that will hereafter be sent to this country when the meat is properly prepared, will in a great measure, it is hoped, compensate for the deficiency of our home supplies. I am, my Lords, yours respectfully,

EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, September* 1, 1866.

LETTER XIII.—A COMPARISON BETWEEN CHOLERA, CATTLE PLAGUE, AND OTHER HUMAN MALADIES.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

My Lords,—Haller, in speaking of Linnæus, says, "He almost dares to place man and a monkey in the same category;" and there are some, perhaps, who may think that the diseases of brutes are better excluded when human maladies are considered, forgetting that to the presence of cow-pock matter in their own bodies they probably owe their exemption from small-pox. As I have said before, I hope hereafter to show that a great amount of light may be thrown upon human maladies by the investigation of the diseases of the lower animals and of plants. My object on the present occasion will be to take only a cursory glance of the prevailing diseases of our domestic animals by way of contrast with those of man, and then make the comparison I have named between Cholera and Cattle Plague. A prevailing error exists, that there is a great similarity between the diseases of man and of the brute; * but on a careful investigation it will be found that, as there is a wide line of separation between man and the inferior animals, so his diseases differ materially from theirs. Obstruction to the circulation, in the shape of what is called inflammation, congestions, and stagnations of various kinds, combined with a vitiated state of the circulating fluid, are the causes of the greater number of lesions in all living bodies. Inflammation, and some of its effects, are nearly the same in all vertebrate animals; and I have seen in a cold-blooded animal—the python (*P. molurus*)—as good a specimen of *pericarditis,* with effusion of lymph, as I have done in the human subject, and so with other organs affected with inflammation; but when we come to investigate special diseases, we shall find a vast amount of difference. In my essay on the causes of death of many of the animals dying at the Zoological Gardens, Regent's Park, from February, 1851, to February, 1860 ("Proceedings of the Zoological Society," 1860), I have given an account of the diseases of foreign animals in confinement; and in the "Transactions of the Pathological Society of London," from 1856 to the present time, I have described many lesions of these animals. Let me now briefly consider some of the more important diseases of our domesticated animals—the horse, the bovine race, the sheep, and the pig. I need scarcely say that all these animals, like human beings, are liable to inflammation of the lungs, intestines, brain, and other parts; but that nervous affections and lesions of the brainular and nervous apparatus are much less frequent than in the human species. Again, the bony and atheromatous state of the arteries, so common in man, is but rarely met with in the brute; and aneurism is of very unfrequent occurrence. When found in the horse, as in a great many instances in the human subject, it may generally be traced to violence. I have found one example of aneurism in a monkey, out of about 230 apes and monkeys I have now examined (*Lancet*, 1854, p. 337); and this leads me to digress for a moment to say a word or two about the diseases of the *quadrumana*. Those who have placed these brutes in so elevated a position appear to me to have performed the part of special pleaders, or, like the "Knights and the Shield" in the fable, have seen but one side, as I have shown in my paper on the quadrumana, read at the British Association, 1864. My discovery of a penis bone in the anthropoid apes ("Proceedings of the Zoological Society," January, 1865) tends, I think, to make the line of demarcation so wide and definite that the most enthusiastic will pause before they claim relationship with the ape. But, as I have said in the paper alluded to, if we compare the diseases of man and the quadrumana, there is but little resemblance between them; and the statement so often made, that most of the quadrumana in this country die of tubercular disease of the lungs, I have disproved long since. I have not space now to enter into this question; but to return to our domestic animals. Of late years, from the importation of foreign cattle, three new diseases have been introduced, not including the Cattle Plague. Small-pox in sheep, as I have stated in my eighth letter (p. 88) in 1810; the next outbreak occurred in 1847, from Merino sheep imported from Tonning. As I have said in this letter, small-pox in sheep cannot be conveyed to man; is not prevented by vaccination; and in some other respects it differs materially from human small-pox. The next disease, imported about 1839, is the Murrain (Epizootic Aptha, or foot and mouth disease), affecting the ox, sheep, and pig, but especially the two former. It is, like small-pox in sheep, highly infectious and contagious; and I think I have known instances where the virus has been conveyed three or four hundred yards by the wind. Unlike small-pox in sheep, it not unfrequently attacks the mouths and hands of persons attending upon the cattle. It is, however, seldom fatal to the beast, and human beings have not generally sustained any great injury from it. It is said that children have been affected by the milk of cows suffering from the disease. The next disease of recent introduction is *Pleuro-pneumonia* (1841). This disease, as is well known, has been very destructive, and has killed more bovine animals in this country than the Cattle Plague, and is nearly as infectious; indeed, in some countries the same stringent measures have been taken to prevent its spread as those adopted against Cattle Plague. This affection is not communicable to man. Horses are not subject to epidemic affections to the same extent as ruminants; and none of their diseases, excepting farcy, glanders, and scabies, are communicable to man. Influenza, which sometimes assumes a typhoid character; inflammation of the lungs, and diseases of the alimentary canal and its enveloping membrane, the peritoneum, are the most fatal. Strangles, weed, colic, intestinal worms, and many other affections might be quoted; but my object is to name chiefly the diseases that are more commonly fatal to our domestic animals. Diabetes in the horse is not an unfrequent disease.

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* See a recent paper in the *Medical Times and Gazette* on "Cattle Plague in Man," by Mr. Harbord.

It is strange that two incurable diseases should be communicated to man by the horse and dog (glanders and hydrophobia). I was a student at St. Thomas's Hospital when the first case of glanders in the human subject was recognized by Dr. Elliotson, and since this period a large number of cases have occurred. It is one of the most frightful diseases to which humanity is liable. In the *Lancet*, 1854, p. 337, I have described this disease in lions, tigers, and jaguars that I examined at the Zoological Gardens. The disease was communicated by means of glandered horseflesh. Other diseases of the horse I need not allude to, except a passing notice of splenic apoplexy, a disease which I have treated upon in the *Bath and West of England Journal*, vol. ii., part 2. As I have shown in my work on the "Structure and Diseases of the Blood-vessels" (1847, p. 343), horses are very subject to worms (*strongylus armatus*) in the arteries of the abdomen, especially when bred in low, moory districts, and I believe that the ass is seldom found free from these parasites in the cæliac artery. The ox is liable also to splenic apoplexy, which kills quicker than Cattle Plague. The most fatal disease in bovine animals, as I have said before, is pleuro-pneumonia; black quarter or black leg, and charbon, are likewise fatal diseases. Epizootic aptha, as I have before mentioned, seldom kills. With the exception of epizootic aptha, scabies, and malignant pustule, there is no disease communicable from the ox to man. In Cattle Plague, as I have remarked in my fourth letter, p. 66, an eruption is produced on the human skin by the acridity of the matter applied, and in splenic apoplexy persons punctured have sometimes died.

In sheep the diseases are more numerous than in the ox, and two entozootic affections are especially fatal to them; the rot, from a worm in the bile ducts of the liver (*Distoma hepaticum*) and worms in the air tubes (*strongylus filaria*). From the latter affection, as I have shown in my "Prize Essay on Parasitic Diseases in the Lungs of Lambs," tens of thousands of lambs sometimes perish in this country. Two other verminous diseases are also fatal to sheep, the tape-worm (*tænia*), and the *cœnurus cerebralis*, or bladder-worm in the brain. Adult bovine animals in this country are but rarely killed by verminous diseases, although they furnish in a larval form one very common human tape-worm, the *tænia mediocanellata*. Calves, as is well known, often perish from the same worm in the air passages as that found in lambs and sheep, the affection familiarly known by the term "hoves." The other fatal diseases of sheep are abdominal affections, such as distension of the stomach, diarrhœa, softened and diseased liver, and inflammation of the bowels. Inflammation of the lungs also kills a great many lambs, as do some brainular and nervous affections in certain districts. Sheep are also subject to black water, splenic apoplexy, braxy, garget, foot and mouth disease, foot-rot, small pox, cattle plague, and many other affections. Tubercles of the lungs are sometimes found in sheep and oxen, and parturient fever is often fatal. Malignant pustule is conveyed to man from the sheep, ox, and horse.

The diseases of pigs are less numerous than those of sheep, although a great many die when young. The most fatal disease is that to be described hereafter. Strangles or quinsy, catarrh, inflamed lungs and bowels, colic, diarrhœa, inflammation of the brain, apoplexy, and other affections have been described. In some districts pigs are subject to tubercles of the lungs, and I have known many of them fatten remarkably well in this condition ; but it may be observed that in all tubercular affections of the lungs of the lower animals, including the quadrumana, cavities are seldom formed, and exhaustive expectoration is therefore absent. The measles in pigs, as is well known, furnishes the baby tape-worm (*cysticercus cellulosæ*), which in the body of man becomes the common tape-worm (*Tænia solium*).

One of the most remarkable and fatal diseases of pigs is that which I have mentioned in my 10th letter, p. 101. Although it appears to have been known for some time in this country under the name of "soldier," from the redness of the skin about the neck, it is only during the last three or four years that it has been generally recognised by the veterinary profession of this country. Dr. Budd, of Clifton, read a paper on this disease at the Royal Agricultural Society, June, 1865 (*Journal*, part I., p. 473). He calls the disease typhoid fever, and he thinks "the ulcerations of the intestines are the very counterpart of those in the typhoid fever of man ;" the disease is not identical, he thinks, "but bears the same relation that small-pox in sheep does to human small-pox." The symptoms are loss of appetite, constipation of the bowels, followed by frequent yellow coloured fluid evacuations, becoming of a dirty greenish colour in a more advanced stage of the disease, and often mixed with flakes of lymph. The conjunctivæ are red and inflamed, and the skin for two or three days, and sometimes for a longer period, assumes a reddish hue, more conspicuous about the neck and sides of the body especially ; there is thirst, fever, dulness of countenance, sometimes paralysis, convulsions, and gradual sinking. In one instance I observed a brownish dry state of tongue. I have seen several pigs affected with this disease, and have examined them after death. I am sorry to differ again from Dr. Budd as to the nature of this affection.

The ulcerations do not resemble those seen in typhoid fever ; indeed, they present a very different aspect, for in some cases nearly the whole tract of the alimentary canal is covered with rupia-like elevations of a rounded form, many of them isolated, and not affecting specially the aggregate glands. The appearance is more like that of small-pox than anything seen in Cattle Plague, and I am not surprised that M. Bouley should speak of it in the *Peccary* as "a confluent eruption like small-pox" (p. 101). I have found the blood in this disease dark and fluid, and with the exception of the brain, which is congested, the spleen and other organs are tolerably healthy. The skin, as I have said before, is covered with an exanthematous rash, of a uniform red colour, not resembling the typhoid eruption in man. There is one remarkable fact in connexion with this disease, viz., that it attacks chiefly young pigs, and in this respect bears a great resemblance to some of the human exanthemata, scarlet fever and measles. It is highly contagious; I have known an instance where a waggon that had conveyed diseased pigs was used again after a month for healthy pigs, and these pigs took the disease. In many instances the mortality is greater than in Cattle Plague; the deaths, too, are often very rapid. In the paper above alluded to, a good account of the affection will be found by Dr. Budd, with some practical remarks by Professor Simonds.

Before I conclude this part of my subject I will allude to matter of great interest in relation to splenic apoplexy in the ox, sheep, and horse, a disease I have already alluded to in my third letter (p. 62). In my book on the Structure and Use of the Spleen (p. 168) I have mentioned the injurious effects of the blood of animals dying of this disease upon man and upon some of the lower animals. According to M. Devaine,* this arises from the presence of *bacteria* in the blood, but I have some doubt as to the correctness of his opinion. I was, however, anxious to ascertain whether Cholera blood would produce any injurious influence upon the lower animals, and I have recently instituted the following experiments:—A girl, affected with Cholera, was bled in a state of collapse, and ultimately recovered. Soon after the blood was taken from the arm I inoculated a puppy, a rabbit, a white mouse, and a pigeon, with this blood, but no perceptible effect was produced. The blood presented the appearance described at page 34.

Let me now consider certain statements regarding the prevalence of Cholera in the lower animals. Many of the older writers have spoken of the mortality of cattle and other animals during human epidemics, and there are not wanting some who believe that quadrupeds and birds may be affected with Cholera. The experiments mentioned above, and those described at p. 25, do not settle this question, but they go some way to show that the lower animals cannot take the disease. In *l'Union Médicale*, February 27, 1849, a chimpanzee at Brussels is said to have had Cholera, from which it recovered. In the same journal, October 27, 1849, M. Liezer describes a case of Cholera in the horse. In 1831, at Marienverdu, Prussia, great mortality occurred among fishes during the prevalence of Cholera. In the *Journal Hebdomadaire*, 1832, at Choisi-le-Roi, near Paris, during the prevalence of Cholera, about 500 of the poultry are said to have died of this disease. They had liquid alvine dejections, and other symptoms that were supposed to be indicative of the malady. If these and other cases, however, are carefully examined, it will, I think, be found that there is no good evidence of the existence of this plague in the lower animals.

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* *Comptes Rendus*, August 10, 1863.

I lastly come to the comparison between Cholera, Cattle Plague, and other human diseases. In my fifth letter, p. 72, I have already made a full comparison between the fevers of this country and Cattle Plague, and in my eighth letter, p. 87, the assumed identity of Cattle Plague and small-pox is also discussed. I have shown that this plague bears no great resemblances to any human affection, but that it is an exanthematous fever with a specific eruption, having a definite period of access and decline. Let us now consider its resemblance to Cholera.

Cholera, like Cattle Plague, has its seat in the East, and travels westward. There is, moreover, some resemblance, as regards the spread of the disease from the gatherings of the Mecca pilgrims, and from the large congregations of cattle that have accompanied the Russian and Austrian armies. The invasion of Cholera is more sudden than that of Cattle Plague; and although in both diseases the alimentary canal is the chief seat of the affection, yet in the one, diarrhœa generally appears at the onset, whilst in Cattle Plague the bowels are more or less constipated. In both affections there is a well-marked period of access and decline, although in Cholera the symptoms are less regular than in Cattle Plague. The rapid depression and sinking in both diseases indicate the virulent nature of the poison and its effect upon the nervous centres. As regards contagion, Cattle Plague is much more easily communicated, and probably with one exception, there is no human disease so contagious as Cattle Plague: I allude to puerperal fever. Both diseases are aggravated by a vitiated atmosphere, and in some degree by over-crowding, but not to the extent generally supposed; for it is notorious that Cattle Plague has often been more fatal in healthy districts, where the animals have been better cared for, than in districts where dirt, over-crowding, and an impure air were all present. The bugbear about the London cow-houses served to amuse the people for a time; but it is well known that the fatality in Cattle Plague has often been greatest where the animals have been better attended to than some of our London paupers. I need only mention the herds of Earl Granville and of Miss Burdett Coutts. The eruption of the skin is less frequent in Cholera than in Cattle Plague; indeed, it is questionable whether strictly it belongs to the first-named disease, and whether, in the cases related, it may not have arisen from accidental circumstances. It appears to have little influence upon the mortality, whereas in Cattle Plague the appearance of the eruption is a favourable symptom. Of the 7 of Dr. Clarke's patients who had the eruption, out of 190, 4 died and 3 recovered. The eruption in Cattle Plague is also very frequently absent, as shown by the evidence at page 109; but it may have escaped the notice of some of my correspondents.

In a comparative estimate of a human disease and one affecting the brute creation, it is necessary to take into account the peculiarities of structure in the latter, and especially the absence of mental causes, and the greater difficulty in interpreting some of the symptoms.

The morbid anatomy of the two diseases affords us more interesting points of comparison. As I have said above, in both the alimentary tube is the part chiefly affected, and in both there is serous discharge from the bowels, and great loss of epithelium from most of the mucous surfaces; but in Cattle Plague the congestions, extravasations, spottings, and stainings are seen to a much greater extent, and there is more disorganization than in Cholera. The blood in both is dark, fluid, and deficient in its serous portion, but to a less extent in Cattle Plague. Stainings and extravasations are common about the pericardium at the base of the head in Cholera, and they are almost constant under the endocardium of the left ventricle in Cattle Plague. The conjunctival, nasal, and labial discharges and eruptive excoriations of epithelium are peculiar to Cattle Plague, as well as the congestive patches on the fourth or digestive stomach. The air-passages, lungs, liver, spleen, and kidneys are generally more congested in Cattle Plague, and the right side of the heart and the pulmonary artery are not so loaded with blood; but it must be remembered that although Cattle Plague is a more deadly disease than Cholera, that the human malady is sooner fatal. In Cattle Plague the time of death varies from the fifth to the seventh day; in Cholera (as I have shown at page 17) the duration varies from five or six hours to seven or eight days. The period of incubation, too, differs much in the two affections. In Cholera, as far as we can ascertain, the period seldom or ever exceeds two or three days; whilst in Cattle Plague the sixth or seventh day is the most usual time, and some have extended it to the twenty-first day. In both diseases, when recovery takes place, it is generally marked and sudden. The comparative rate of mortality is given at page 17; and as regards temperature, the highest I have met with in Cholera is 105° Fah.; in Cattle Plague it is described as high as 107°. In both diseases the pulse and breathing are generally accelerated; but in Cattle Plague the pulse does not fall so low in frequency (taking the natural rate of pulsation into account) as in many cases of Cholera. There is another remarkable difference in the two diseases—viz., that whilst in Cattle Plague the secretion of milk is suppressed, in Cholera, as shown by many examples at the London Hospital, the lacteal fluid is undiminished in quantity. The loss of the fœtus (as I have shown at pp. 15, 109) occurs in both affections. Other differences might be enumerated, such as the blueness of the surface, the cold tongue and breath, cramps, sunken eyes, and altered voice, in Cholera; and the tenderness over the spine, the unpleasant odour of the breath, the frequent presence of air in the cellular tissue of the back and loins, and in some cases convulsive twitchings of the muscles, in Cattle Plague. In this disease, too, although the gall bladder is generally much distended, the bile passes into the intestines, and the urinary secretion is not arrested to the same extent as in Cholera.

And, lastly, let me ask what practical facts do we derive from the above comparison? Some, who believe in the unity of disease, may come to the conclusion that Cholera and Cattle Plague are the same affection, and that the difference in the symptoms and morbid appearances are only the result of difference of structure; but, without entering into these speculative questions, let me point out one or two practical inferences of more importance. The first is, that whilst Cattle Plague in all its stages is at present very little amenable to medical treatment, Cholera at its onset in the great majority of cases is a controllable disease, owing to the less amount of disorganization on the mucous surfaces. The pathology of both diseases also teaches us that there can be no specific for either, and that in Cattle Plague especially (if treatment were allowable) the most rational would consist of that which I have advocated in my last letter.

I am, my Lords, yours respectfully,
Edwards Crisp, M.D.

42, *Beaufort Street, Chelsea, September* 10, 1866.

LETTER XIV.—ON THE PRETENDED SCIENCE OF HOMŒOPATHY AS APPLIED TO THE TREATMENT OF MAN AND OF THE LOWER ANIMALS.

That which all reason does defy,
No man of sense should ever try;
If premises are insecure,
Conclusions never can be sure,
And what on surface seems to be
To some men, a reality,
If sifted well, will soon be found
At the core rotten and unsound.
The Author.

My Lords,—In addressing so many of noble blood and of refined intellect, it may be thought by some that I should speak with more modesty and deference; but, my Lords, science knows no distinction, except at our Royal Society,* where the name of a commoner must be posted for ten months before he can be balloted for, whilst one of noble birth is at once elected a Fellow without opposition,—a proof, if any were wanting, of the value set upon our aristocracy by men of science and erudition; and if such is the opinion of erudite and learned men, what must be the influence upon many agriculturists and owners of cattle, when they read the list* of the president and committee of the Association for the Cure of Cattle Plague by the Homœopathic method? This committee consists of five dukes, one marquis, eight earls, four lords, four viscounts, seven baronets, two honourables, four colonels, and five commoners. Among these are six members of the Privy Council, and the late president and present journalist of the Royal Agricultural Society; so that this association may be said to represent the government and the agricultural science of England.

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* If I were ever ambitious enough to desire the fellowship of this Society the above quotation of the laws would be quite sufficient to reject me. The late Mr. Yarrell, who had done more for Zoological science than ninety-nine out of a hundred of the fellows of the Royal Society, as shown by his works on British Birds and Fishes, and by his numerous papers, told me that after his name had been suspended for ten months he was privately told that he had better withdraw his name, for he would be rejected because he was a tradesman.

As I said in my sixth letter, it is a proper beginning for the Government, which, in relation to this pestilence, have dealt in infinitesimals from the commencement of the plague; and the same remark will apply to the Council of the Royal Agricultural Society, which, after six months, when the disease had been sown broadcast throughout the country, began to move, and came out with its patchwork resolutions (October 7th). Let me again ask, my Lords, if the plan I suggested in my first letter (September 21st) had been adopted, what advantages would have been obtained? how many plague-stricken animals should we now have in England? There is another curious problem, my Lords, that it is impossible to answer—viz., how many animals have been sacrificed by this pretended homœopathic cure—not by the medicines administered, but by the extension of the disease in the attempt to treat it under false pretensions? But I have a higher motive for introducing this subject of homœopathy than that in relation to Cattle Plague: it is one that concerns the whole human race; for if this doctrine of *similia similibus curentur* is founded on fact, nearly all civilized people on the face of the globe are wrongly treated, and the art and science of medicine is a cheat and an imposition.

If a man gifted with reasoning powers were told that he could get his dinner off the decillionth part of a mutton chop, or that he could get intoxicated by sniffing claret, he would call his adviser a fool or an idiot; yet, my Lords, the statement is quite as reasonable as the supposition that imponderable or infinitesimal doses of any medicine can produce the slightest curative effect upon man or brute.

But what is this pretended science of homœopathy, this compound of philosophic reasoning and logical deduction? My Lords, it is the very worst species of quackery, because, under a philosophic guise and pretended stable basis, its very foundation is rotten at the core and baseless as a shadow!

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* Published by the Homœopathic Association.

You want to lead
My reason blindfold, like a hamper'd lion
Check'd of its noble vigour; then, when baited
Down to obedient tameness, make it crouch
And show strange tricks, which you call signs of faith:
So silly souls are gulled, and you get money.
Otway.

The study of organized beings, from the lowest plant to the more complex structure of man, requires deep thought, long and laborious application; and those only can comprehend the workings and derangements of the animal machine who are well acquainted with its mechanism. "*Pour connaitre l'homme malade il faut connaitre l'homme sain.*" So, my Lords, in describing this pretended science of homœopathy, as those I address have for the most part only a smattering of nature's mysteries, I must endeavour to make my remarks plain and intelligible to all. Man is naturally a superstitious and over-credulous animal, and often the higher his position the greater his gullibility and capacity of swallow. When the divine right of kings was a more fashionable doctrine than at present, for nearly six hundred years the royal touch was considered of great efficacy in the cure of most diseases, and even as late as the reign of Charles II. the king touched 23,600 of his subjects for the evil in five years; and Wiseman, his surgeon, says,—"I must needs profess that his Majesty cureth more in any one year than all the chirurgeons have done in an age."

The repeated cures of Mr. Gratrix, the stroker of Prince Hohenloe, Johanna Southcote, St. John Long, and of a hundred others, need only be mentioned to show the credulity of mankind, and the love of the human race for novelty and fiction. Dr. Johnson said, "that if a man could get upon a tree, and preach with his head downwards, he would be sure to have a large congregation, whatever his doctrine."

The vagaries of that pretended philosopher, Hahnemann, the founder of this medley of false assumptions and imaginary inferences, as exhibited in his "Organon" and in his other works, are so palpable and self-evident, that the only rational and charitable conclusion is (as many of his contemporaries asserted) that he was insane.

Listen to some of his wanderings: "The quintillionth attenuation of a grain of gold put into a small clean vial will restore, by ovation or smelling, despondency in an individual with a constant inclination to commit suicide, in less than an hour to a peaceful state, love of life, and to a sense of horror of his contemplated act."

Your Lordships well know the omnipotency of gold, as Fabian says in one of his Fables (XIV. of the "Charlatan"), which I translate:—

Surrounded by a gazing crowd,
A man in accents, long and loud,

Cried, " Buy my powder, for it will
Be remedy for every ill.
Sirs," said he to wondering throng,
" To this *all virtues* do belong:
T'will cure all grief, make cowards bold,
Give wives and husbands to the old.
By it the fool, in the world's eyes,
Becomes at once both learn'd and wise.
Its influence is so great, that you
May friends obtain, and all things do.
In fact 'tis known, both wide and far,
As the Encyclopædia."
The Charlatan his powder sold,
'Twas found to be a *mite* of gold.

But gold does more than even Fabian surmised; it makes a British House of Commons, as exemplified by the exposures now going on at Yarmouth, Totnes, Lancaster, and Reigate. The *purse*, not the man, is the winner. But the mite of the charlatan, or the fifty sovereigns of the candidate for parliamentary fame, had not the supposed power of the imponderable and incomprehensible dose of Hahnemann. But there is something more tangible and positive about it!

Again, Hahnemann says, that "all chronic diseases arise from itch (psora), and can be cured by the remedies used for curing itch." Now, every tyro in the profession knows that the itch is caused by an *acarus* (mite) which traverses the human skin much as the mole does the earth, and that if you block up his breathing holes with lard, without any sulphur, you may kill the* *acarus* and cure the disease. So much for the power of homœopathic sulphur.

But let us look to the origin of this wonderful discovery. Hahnemann took twenty grains of cinchona bark for debility, and he supposed that it produced ague; and upon this false conclusion, this wrong inference, the whole system of infinitesimals, imponderables, triturations, and olfactions is based. I knew a blacksmith many years ago who cured ague sometimes, by giving the patient (an hour before the expected fit) a piece of paper to swallow upon which some dog Latin was written, so much effect had the imagination upon the disease.

Among the few medicines that really can be called cures, or specifics, quinine for ague is the most potent, and if given in doses of five grains three times daily, the disease, in the vast majority of cases, will be removed; but try a homœopathic dose, and I venture to say that, unless in some exceptional cases, where the imagination, as in the example of the blacksmith, exerts some influence, the patient will go on shaking in spite of the imponderables. But again, it is utterly false that bark or quinine will produce ague; tons of this medicine have been given during the last twenty years, and there is no example well authenticated on record where genuine ague has followed its administration, although a shivering fit may occur sometimes as a coincidence.

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* I have seen my friend, Dr. Bazin of Paris, who is Physician to the Hospital St. Louis, cure many cases of psora with lard only.

So this pretended basis must fall to the ground; it is altogether unworthy of credit.

Let us next examine the effects of phosphorus on the human body.

It is asserted by the homœopaths "That it will produce inflammation of the lungs and cure it." But this assertion is equally erroneous. I have tabulated a great many cases of death from phosphorus, and in no single instance was inflammation of the lungs found. But let me refer to Taylor's "Medical Jurisprudence," 1865, where a number of cases are given, and in no instance is pneumonia mentioned. That the vapour of phosphorus may, like some other gases, produce irritation of the bronchial membrane, is tolerably certain, but this affection is altogether different to inflammation of the lungs.

Look, again, to the effects of belladonna, which is said "*to produce symptoms like scarlatina and to cure this disease.*" The rash, when it does appear, is unlike that of scarlatina, but the occurrence of the rash is the exception, not the rule. Indeed, in the works of Beck and Taylor on Medical Jurisprudence, the authors of which write without any reference to homœopathy, the presence of the eruption is not named; but if it were present, what resemblance would the other symptoms bear to those of scarlatina? Giddiness, dilated pupil, imperfect vision or blindness, twitchings, convulsions, dryness of mouth, and thirst, nausea, vomiting, &c.

Arsenic, say the disciples of Hahnemann, "*will produce symptoms like Asiatic Cholera*, and it will cure Cholera." The serum of the blood in Asiatic Cholera runs off by the bowels, leaving the vital fluid in the vessels thick and tarry, but no such effects are produced by arsenic, nor do the character of the vomiting, the nature of the matter vomited, the appearance of the evacuations, nor the intensity of the cramps (in many cases) bear any resemblance to those occasioned by arsenic.

Tartarized antimony will, it is said, "like phosphorus, occasion and cure inflamed lungs," but in the majority of cases (as shown by Taylor and others), this drug does not occasion pneumonia; the effect is chiefly upon the stomach and intestinal canal. In the dogs poisoned by Majendie the lungs were of a violet colour and distended with blood; the stomach and intestinal canal red and inflamed. In rabbits poisoned by Brodie with tartarized antimony, the stomach was chiefly affected.

It must not be supposed that the so-called homœopathic doses for the cure of Cattle Plague and other diseases are all infinitesimal. If Hahnemann were alive again, he would not recognize his own doctrine! A gentleman, whose cows I saw before giving the homœopathic solution of arsenic to a cow, administered two drops to a kitten, and the animal was killed in a short time. But let us take a case of recovery reported by Dr. Kidd, of Blackheath, a professed homœopath, in the

Times, November 7. Dr. Kidd gave a cow $\frac{1}{10}$ of a grain of arsenic every two hours on the first day, increased the dose to $\frac{1}{3}$ of a grain every two hours on the second day, with $\frac{1}{50}$ of a grain of phosphorus, besides the vapour bath. When the cow was supposed to be dying, she had old ale and four bottles of Barclay's stout; and this is called homœopathic treatment! Hahnemann would have put the arsenic to the cow's nose, for he came to the conclusion that all medicines in inconceivable doses if given by the mouth were too potent, and that *smelling* alone was sufficient! He altogether protested against the administration of two medicines at the same time, and alcohol in any shape he repudiated.

The *Times*, so satisfied with this and other like examples, says (November 29),—"If the prophylactic dose of arsenic should actually be efficacious, our cows may be sent to market with perfect safety. The antidote will operate like vaccination in the case of small-pox, and in the end the disease ought to disappear."

There is a fish (*Chiasmodus*) in Dominica that not unfrequently swallows another fish much larger than itself, so that its skin is distended to bursting. The capacity of the swallow of the *Times* editor for the marvellous must exceed that of the fish in question!

My Lords, it is such namby-pamby twaddle as this, combined with the spontaneous generation theory, so obstinately maintained by the "leading journal," that will cost the country millions of pounds! But there is one matter connected with the public health of great importance, viz., the effect the milk, flesh, and tripe are likely to have on infants and delicate persons using them for food when an animal has long been under the influence of arsenic, not in homæopathic doses, but in quantities that many of the pretended disciples of Hahnemann and others administer. I have recently been lustily abused for cutting into the stomach of an ox that had been killed for Cattle Plague, because the owner said that it "spoilt its sale for tripe." If this animal had been long under the influence of arsenic, what would have been the effect upon the person eating the tripe? This is a matter of more importance than at first sight appears, and it is not unlikely that many persons have unknowingly suffered from this cause. This is a question that appears hitherto to have escaped notice.

After this *exposé* I need not devote much time to the consideration of the homœopathic treatment of Cattle Plague, because the remarks that are applicable to man apply with equal or greater force to the brute creation. Let me quote a few more of these homœopathic doctrines, although it is waste of time to consider them.

1st. "That there is no conservative power of nature (*vis-medicatrix naturæ*) as maintained by the allopathic school." 2ndly, "That two different medicines should not be given at the same time." 3rdly. "That the homœopathic aggravation must be more intense than the primitive disease."

So to cure Cattle Plague the imponderables must occasion a *more malignant and intense action*, a difficult matter I imagine, if very potent poisons were used in large doses, but exciting intense action by putting a decillionth part of a grain of arsenic or phosphorus into a hundred weight or more of dry vegetable matter, is too absurd a conclusion even for the believers of the adventures of Baron Münchhausen.

Homœopathy, like all false doctrines, can only flourish in the dark, and will not bear the light of day, as the recent investigations at Norwich and Newcastle fully disclose. But as there is said to be no evil without its attendant good, so the results of the globular treatment of Cattle Plague will tend to open the eyes of some of its votaries, and lead them to ask themselves whether the whole doctrine is not a delusion and a sham ? I am far from being a convert to some of the doctrines of the schools respecting the action and efficacy of many medicines ; and one can readily believe that in some diseases both man and brute may do as well, or better, without medicine as with it, but the assumption that the decillionth part of a grain of arsenic, or of any other drug, will have any effect in Cattle Plague, is about as reasonable a supposition, as that a farmer might manure a fifty-acre field with a grain of sulphuretted hydrogen.

I now come to the practical question and ask, what proof have we that the homœopathic treatment was beneficial in any case of Cattle Plague ? Through the influence of certain noblemen, and by the advice of some of the Commissioners, the Government sent Mr. Moore, a homœopathic veterinary surgeon, into Norfolk, to try this system, and, according to the report of the Cattle Plague Committee, the treatment had entirely failed ; at Newcastle, in Cheshire, and in other places, the same verdict was given.

A gentleman who watched the Norfolk trial writes me—" If the Norfolk trial has not sealed the fate, that is, shown the utter fallacy of the homœopathic mode of treatment, all I can say is it ought to have done." Mr. Forrester, who had no prejudice against homœopathy, says, it has been fully and fairly tried, and " it was wholly and entirely a failure." But the most amusing part of the affair is, that porter and stimulants were freely given ; adjuncts, as I have said before, that Hahnemann would have entirely repudiated.

Dr. Hamilton had stated in the *Times* that 75 per cent. had been cured in Holland, and at the Cattle Plague Meeting at Norwich, December 11th, Viscount Bury increased the number to 85 per cent. Instead of spreading* the disease by this means and wasting the public money, would it not have been better, my Lords, to have established the one experimental hospital I advocated in September, where this, and fifty other matters that are now obscure and doubtful, might have been *quickly* decided without danger of spreading the Plague by a thousand foci of contamination? The pole-axe would have been used much sooner then it was, and the country would have been saved a vast amount of money.

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* In the week ending August 11, 1866, no less than 1,225 cases are reported in Holland, and yet some people are complaining that Dutch oxen are excluded from this country.

It is painful, my Lords, to have wasted so much time in combating a shadow, but as this shadow by many Nobles and Priests is very constantly thrust upon the people as a real and substantial good, I have thought it right to lay bare the empty and hollow pretensions of the system, and to expose its false and fatal inferences.

That many people of fertile imaginations and with slight ailments, who have been making apothecaries' shops of their stomachs for years, may be benefited by this do nothing system, when combined with great attention to diet, I readily admit, but I moreover believe that a great number of lives are lost by tampering and playing with disease at its onset, when the ordinary appliances of the medical practitioner might have averted the danger, and have restored the patient to health.

I am, my Lords,
Yours respectfully,
EDWARDS CRISP, M.D.

42, *Beaufort-street, Chelsea, Dec.*, 1865.

LETTER XV.—ON THE STATE OF THE MEDICAL AND VETERINARY PROFESSIONS AS AFFECTING THE PUBLIC HEALTH AND THE WELFARE OF THE AGRICULTURIST.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—The subject of my letter may appear strange to many who may think that science and politics should not appear in the same page, and that the one has no connexion with the other; a cuckoo cry, that has served the purpose of too many that have re-echoed it. I labour under the impression, my Lords, as I have said before, that if we had had a representative faculty of medicine in each of the three kingdoms, a representative veterinary college in England, Ireland, and Scotland, and a national agricultural university and board of agriculture establishments that I have long advocated, that we should not have waited four months for the report of a Royal Commission on the Cattle Plague, twelve months for a scientific report, and eight months for the opening of Parliament; nor should we when the Government were informed that our herds were in danger, have had two gentlemen sent on a flying visit by the three agricultural societies to investigate Cattle Plague, and to report "that the disease could never reach our shores," as stated at page 79. A commission would have been *formed at once* of the professors attached to the above-named colleges and universities, and the disease, as in France, Belgium, and Prussia, would have been quickly eradicated. If we had had a faculty of medicine in 1832, we should not, as I have mentioned at page 27, have had the President of the College of Physicians recommending that troops should be "drawn around infected places, and that the victims should be buried in detached ground;" nor should we, during the present epidemic, have had a committee of a college of physicians (p. 42) expecting captains of ships to look for "obviously indigestible food, and unnaturally offensive discharges."

My Lords, I hope that there is a brighter future for science in this country, and that the time is not far distant when many of the clogs and shackles that now encumber her progress will be removed, and when many of the changes I have long advocated will be carried out; when scientific professors will be paid by the State, and when the poor and enthusiastic student will have some chance of reward for his labours; not looking forward, as at present, to the prospect of starvation and a garret. When, at our British Museum of Natural History, our National Colleges of Chemistry, Geology, Mineralogy, Mechanics, Botany, and Agriculture, all the professors will be compelled to give gratuitous lectures to the public, so that *things* may be learnt instead of *words*, and a taste given for pursuits that tend to expand the mind and elevate the sentiments more than all the formal and stereotyped studies of the schools. The weed that grows under the college window, if properly investigated, will teach more than anything that can be gained from heathen poets and philosophers. But it will naturally be said, "look to the great men that England has produced," and I should be the last to detract from the merits of my countrymen, but the question is not what a field *has* produced, but what it *might* have produced under proper cultivation. Our medical, chemical, and other students go to foreign schools, but who ever heard of a foreign student coming to England to learn anatomy, medicine, chemistry, or any other science? Can anything, my Lords, be more condemnatory of our system than the fact, that whilst Paris and other Continental schools are full of English, American, and other students from all quarters of the globe, such a *rara avis* as a foreign student is seldom seen in this country, and then he is probably driven here, like our rarer British birds, by some accidental circumstance. The whole system is dead, stale, and unprofitable; there is no life, spirit, nor energy about it. Go to the Hunterian Lectures at the College of Surgeons, and see the empty benches before the Lecturer. I have sometimes counted an audience of nine at these gatherings; and so at our School of Mines and other scientific lectures, the hearers are "few and far between." As I said in my first letter, to borrow from *Punch*, "Smith got his pictures well hung at the Royal Academy because his mother washed for a Royal Academician;" and so, my Lords, with the scientific and other appointments in this country, money and interest are the ruling powers. The old Tory argument was that we were not to complain of corruption, because "dung produced melons;" but as very few eat the melons, the people at large, I fear, are little benefited by the growth. But let us look to the career of Cuvier, Dupuytren, Louis, or any of the great men that France has produced, all have won their honours by dint of hard labour and talent; step by step they have gained their elevations by *concours;* but what a contrast does this country afford to that of France in this respect? A city merchant or rich tradesman thinks it a good speculation to pay a hospital surgeon a thousand pounds for his son's apprenticeship, as the money will go far to insure his appointment as surgeon to the hospital. Mr. South, at an oration given to the Governors of St. Thomas's Hospital, January, 1851, at which I was present, said "That in 1710 the surgeons were not allowed to take more than three CUBS or apprentices at the same time, and that in the whole history of the hospital no man had been a surgeon who had not been an apprentice," or, in other words, who had not, like many of our members of Parliament, bought his place.

After this preamble, my Lords, let me come to the questions that form the heading of this letter, and first let me allude to the state of the veterinary profession in the three kingdoms, one that not only concerns the welfare of the agriculturists, but indirectly the health of the people. And here let me pay a well merited compliment to the members of the veterinary profession for their conduct during the present outbreak of Cattle Plague; for, in spite of abuse and obloquy heaped upon them from all quarters, those who dared to speak out adhered to the honest, straightforward, and disinterested course, and plainly told the Government that the best plan "was to stamp out the disease." To Professor Gamgee, although I believe he made a great mistake in supposing that Cattle Plague could be eradicated without stopping fairs, markets, and all movements of cattle, I think the country is much indebted for his early warning to the Government, and for his outspoken and fearless denunciations of its policy. In speaking of the veterinary profession I include a great many respectable members of it who have not the diploma of the College, and I trust that no word will escape me that will be offensive to any one, for the farmers, shoemakers, tailors, and others who have acted as inspectors were not to blame, the honour was thrust upon them.

In France, and in many other countries, all who practise the veterinary art are obliged to undergo a regular course of study, and to pass an examination before they can practise. To take France as an example, we have here three veterinary schools or universities (Alfort, founded 1765; Lyons, 1762; and Toulouse, 1761), where students must spend *four* years in the acquisition of knowledge before they are eligible for examination. But what is the state of things in this country, where our stock of all kinds is of much greater value, and where the people are better able to pay for education and instruction? In England we have a London Veterinary College, consisting of less than a thousand members, including those in the army,—a college that is more like a charitable dispensary, aided by the Royal Agricultural Society, all the members of which are privileged to send animals free of cost; the students not examined by members of the veterinary profession; and instead of *four* years' study, as in France, Belgium, Austria, and Prussia, they are let off with *one*. For thirty-seven years only one veterinary surgeon was thought qualified to sit among the examiners; and when, in 1827, it was suggested that more veterinary examiners should be added, the medical committee objected. At the annual elections ladies and members of parliament were allowed to vote by proxy. To use the works of Mr. Fenwick ("Veterinarian," July, 1829), "A joint-stock company, where gentlemen may send their horses at the cheapest rate, and where human surgeons, ignorant of the anatomy and diseases of horses, are the examiners."

Let us take the annual report of the governors of the Royal Veterinary College, as published in the "Journal of the Royal Agricultural Society," 1865, p. 166:—

> "Notwithstanding the advance which the science of cattle pathology is making under the system of co-operation, which exists between the Royal Agricultural Society and the Royal Veterinary College, the Governors have had under consideration the question of rendering the College, *if possible*, even more effective; and they entertain hopes of being able hereafter to adopt still more effectual measures for the promotion of the common objects of the College and the Society. The Governors of the College, who are also members of the Council of the Royal Agricultural Society, will be able to inform the Council that at no period since the system of co-operation between the two bodies was established, have the Governors paid more attention to the advancement of their common objects than during the present year, or have made greater exertions in this sense."

This is the substance of the report of the non-professional governors of the Royal Veterinary College of England; and I seriously ask, my Lords, whether my statement that this institution is a mere club, that it has nothing national or universal about it, is not a correct one? Is it not a scientific farce? And yet Mr. Newdegate, Mr. Holland, and other governors, pride themselves on their scientific management, and "hope that the system, *if possible*, may become even more effective." The italics are mine. I refer your Lordships to this and other reports in the "Journal of the Royal Agricultural Society." A college or university, to be useful and efficient, must depend upon the ability of its own professors, and must not be crippled and confined by money subscribers, and by those who are ignorant of the very elements of the studies pursued. But how happens it that, if the system is so "*effective*," the professors of this college were kept so much in the back-ground in the scientific report of the Government, a matter in which they were specially concerned? Their absence was a *stigma* upon the whole veterinary profession, and upon the system so lauded.

In Scotland the veterinary profession is in a worse state than in England; a college, under the control of the Highland Agricultural Society, and, according to Professor Gamgee ("Veterinarian," July, 1866, p. 613), consisting only of about 200 members in Scotland.

In Ireland there is no veterinary college nor instruction of any kind.

And how, my Lords, is this strange and neglectful state of things to be remedied? A bill is now before parliament to prevent those who are not members of the London and Scotch Veterinary Colleges from calling themselves veterinary surgeons. Nothing is said about Scotland, and protestations are made by the Scotch against the London monopoly ("Veterinarian," June and July, 1866). As Ireland cannot be in a worse condition than at present, she makes no protest; indeed, there are none to complain. My Lords, nothing short of a grant of money from the government, the establishment of a college in each of the three kingdoms upon a liberal footing, can meet the requirements of the times. If this bill of the patrons of the London Veterinary College should become law, it will only, like the pharmacy bill which I protested against in 1852, add to the corporate patchwork which at present exists.

The state of the medical profession in the United Kingdom will readily account for the condition of the veterinary art which I have described. It will scarcely be credited, in these days of manhood suffrage and of competitive examinations, that of the 20 bodies in this country, including the Archbishop of Canterbury, that confer medical and surgical degrees, nineteen out of twenty of the diploma-holders have no voice or power in the management of their own affairs, or in the election of their governors. Like the little boys at the peep show, they pay their money and there the matter ends. I belong to three of these corporations, and I have written to them all to ascertain how the money is expended, but I can get no satisfactory information. Among these bodies there are ranks and distinctions to suit all tastes and pockets, grades in the very chambers of death, physicians without surgical knowledge, surgeons without medical knowledge, and apothecaries who should do the bidding of both. In my evidence before the House of Commons on the Pharmacy Bill, 1852 (Minutes, pages 156—165), I have given the qualifications of 10,947 members of the profession in this country, and if this return be consulted, a strange medley it will be found!

The subjoined device which I have sketched will at once tell you, my Lords, the value of the parchment, and the lines I have appended will convey some idea of the unity that prevails—

Now discord reigns in Britain's favour'd clime,
Three monstrous heads guard Med'cine's sacred shrine,
More monstrous far than Cerberus of old,
For twenty limbs an ugly body fold,
And stop its progress, for when one would go
In the right path, another holds it low,
And Fashion, curse of science, Folly's tool,
Measures all parchment by a golden rule.

The Author.

I need not, my Lords, enter upon the history of these corporations, it is too well known to the members of the profession. They have only looked to their own petty interests, and have never thought of the general good. To quote from Mr. Lawrence's speeches of 1826:—"Self-elected and irresponsible bodies have always been found the most unsafe depositories of power."

In the *Lancet* and other medical journals; in the evidence taken before Mr. Warburton's Committee of the House of Commons, 1834, and the Parliamentary Report of the Medical Registration 1847-1848, will be found abundant proofs of this. I commend these reports to your Lordships' perusal.

In 1836 the British Medical Association was formed. Among its members were Marshall Hall, Professor Grant, Drs. James Johnson, Granville, G. Webster, and Messrs. Wakley, Liston, Grainger, Pilcher, and many other men of note. The objects advocated were a representative Faculty of Medicine and Surgery in each of the three kingdoms with one portal for all, and to show, my Lords, how early my political opinions were formed, I quote an abstract of my speech at the first meeting of this Association. I have never deviated from the opinions I entertained when I first entered the profession, and I am much prouder of these, and of the efforts I have made to carry them out, than of any little contributions I may have made to science.

Mr. Crisp.—The argument used by Dr. Thompson has been this—that the public are not sufficiently enlightened to distinguish men of talent. If they are ignorant, it is our duty to enlighten them, and I hope that the plan which we propose will effect that end. According to the present state of medical affairs, the public have no opportunity of drawing the distinction. (Applause.) Every man who puts a coloured bottle in a shop-window is called a "Doctor," and chemists and surgeons have that appellation commonly assigned to them. But if there be a Faculty of Medicine, and if all be *compelled* to undergo *one description of examination*, and our public institutions and hospitals be thrown open, then will the public be better able to appreciate the man of talent. (Applause.) Dr. Thompson's arguments, therefore, fall to the ground. Certainly, his assertions ought not to be allowed to stand uncontradicted. (*Lancet*, January 21, 1837, p. 606.)

In 1844 Sir James Graham's Bill would have repealed all charters, and would have established a Council of Health and Education; the bill, after being patched and tinkered in various ways, was quietly disposed of. As in the case of Mr. Warburton's Bill the corporate interest was too strong. Mr. Wakley's Registration Bill of 1846, and its withdrawal from the same cause, is well known.

In 1844 the National Institute of General Practitioner was formed, numbering more than four thousand members, all praying for a National Institute of Medicine upon the representative principle and a "one portal for all." Then came the Committee of Inquiry, 1847-1848; the new charter of the Royal College of Physicians enabling this body during the "year of grace" to fill its empty coffers, and the new charter of the College of Surgeons allowing it to sell its fellowships, so that up to this period they have realized a large sum of money. Then appeared the Registration and New Medical Act, confirming the power of the corporations whose unjust and exclusive acts the profession had so long protested against, compelling all to pay a registration fee, the government at the same time taking all it can get from the quack and the charlatan in the shape of licence duty, whilst a member of the swell mob, or a blacksmith, may open a chemist's shop and dispense the most deadly poisons.*

Now vilest compounds are reputed cures
For ev'ry evil that the flesh endures,
And our wise rulers give a helping hand
To secret nostrums that disgrace the land.
Lift science with the right, then give a blow
With other palm, that quickly lays it low,
So that our Gallic neighbours, laughing say,
"The Paradise of Quacks is o'er the way."

The Author.

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* I was the first, in the *London Medical Examiner*, January, 1851, p. 241, to protest against the indiscriminate sale of poisons in this country. I quote the conclusion of the article: "We have surely said enough to convince the most incredulous of the necessity of an *immediate* remedy for this crying evil. The one we suggest is, that no person shall be allowed to procure a poison of *any kind*, without an order from a magistrate, a clergyman, a medical man, or the registrar of the district, and that arsenic, the most common instrument in the murderer's hands, shall be coloured and scented before it is *retailed* to the

This council of 23 persons, by which we are governed, represents the interests of all the corporate bodies, and without stating the exact numbers, the whole of them have been elected by less than 300 persons; so that the medical profession, notwithstanding the numerous petitions to the House of Commons in favour of representative government, has no voice in the matter. To quote from my evidence before named on the Pharmacy Bill, question 2,321, " I look to the future: I hope that we shall hereafter get a different class of men in the House of Commons, and that they will frame a Bill that will be for the public good."

Those who petitioned for reform have got a King Stork, that, in the shape of a Medical Council of Education, has swallowed up representative government and all the just demands of the profession; for in many respects we are in a worse condition than before the Act passed. Quackery and illegal practice are as rampant as formerly; and, as I said before, the corporations have managed to get everything into their own hands, and the inequalities on the register, as regards qualification, are greater than heretofore. As the duty of this Medical Council is to regulate all matters relating to education and the good government of the profession, and to show the utter inefficiency of this body for the purpose, I may mention two circumstances of recent occurrence that I have already published,* and that I have placed before this Council for investigation: the one the Carmichael Prizes of £300; the other, the Triennial Prize of £50, at the Royal College of Surgeons, awarded April, 1862. According to the printed rules, all who compete for this prize "must use a motto, all recited cases must be placed in an appendix, and original facts are to be the principal points of excellence." But the gainer of the prize did not comply with one of these requirements. Shortly before the essay was sent in, he copied, verbatim, papers that were published four years before; of the 208 pages composing the essay, not one-twentieth part is original, and nothing new is added; the cases before published are in the body of the work, and on thirteen different occasions he tells the three adjudicators, *one of them his own colleague*, that he is the author of the essay! The treatise, moreover, is full of positive and unmistakable errors, about which there can be no doubt nor cavil.

My Lords, on this and on all former occasions when I have made such exposures, I have not been influenced by pecuniary motives or by personal spite. I mention the above examples of corporate injustice, and I could add largely to the list, for the purpose of showing

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public. Some few rats and mice may escape death by this arrangement, but our business is with preservation of *human* life." Like the Public Health Act, mentioned at page 45, the law since past is a very inefficient one, as seen by the reports in the daily and weekly press.

* Exposé of the Carmichael and Harley Prizes, 1862, placed before the Council of the College of Surgeons and before the General Council of Education.

that with a National Faculty of Medicine, *open to the light of day*, such a gross dereliction of duty, such a breach of a sacred trust could not have occurred; but there are two important questions involved in this matter, my Lords, to which I especially direct your attention. At this college, when a gentleman has arrived at the mature and respectable age of forty, if he can get six fellows to vouch for his respectability and honesty, and his character is approved of by the Council, he (without examination) buys his fellowship and his right to vote for ten guineas, and up to the present time since the new charter (1854), for the sale of these titles, the college has received about £10,000! So that the adjudicators of this prize may sit in *secret* conclave on the merits of the candidates for the fellowship, and reject or admit them at their pleasure! It must not be supposed that I ever coveted this pecuniary honour. The other inference is this, that the Council of Education have refused to interfere in these two questions that especially come within their province, so that the profession in such-like matters has no court of appeal. But let me give the other example that I have alluded to.

The late Mr. Carmichael, of Dublin, was an enthusiastic reformer, and advocated the establishment of a Faculty of Medicine in each of the three kingdoms (*Dublin Medical Press*, 1840, p 361). In his will, Sept., 1849, he directed "That the interest of £3,000 should be applied every four years to two prizes (£200 and £100) on medical reform. If the Essays in 1854 were not thought worthy, the Council of the Dublin College of Surgeons might postpone the grant till 1859." I was a candidate among many others, and although the will distinctly stated that the prizes were to be awarded in 1859, the award has been illegally withheld. I copy verbatim the summary and conclusion of my essay.

SUMMARY.

THAT a One-Faculty of Medicine and Surgery shall be established in each of the Three Kingdoms, composed of Councillors, elected by Graduates, Members, and Licentiates, of the various Universities, Colleges, and Halls by means of a balloting paper; that the individual so elected shall appoint a Senate for the regulation of Medical Education and Examination, under the supervision of the Privy Council.

That all who enter the Medical Profession shall pass four examinations, conducted at various periods:—

The 1st, a preliminary examination, in the Classics, Natural Philosophy, the lower branches of Mathematics, and the outlines of Natural History.

The 2nd Examination shall be, in Anatomy, Physiology, and Chemistry.

The 3rd in Medicine, Pharmacy, and Midwifery, including diseases of Women and Children.

The 4th in Surgery, and in such branches of Anatomy and Physiology as especially relate thereto.

That these Examinations shall be conducted in each of the Three Kingdoms, in such place or places as the Government shall direct; and that a proper Laboratory and dissection room shall be attached, so that the examinations may be rendered as practical as possible.

That all who pass these Examinations shall receive the title of Licentiate of Medicine and Surgery, which alone shall qualify for practice; and that all other titles obtained at the various examining boards shall be honorary.

That as the good of the State and the general welfare of the people are intimately connected with the progress of Medical Science,—the Government shall elect Professors in the various Capitals, giving them such salaries as will enable them to devote their exclusive attention to scientific pursuits; and that when vacancies occur, these vacancies shall be filled up by persons recommended by the representative Senate; so that the selections will not be made, as is too often the case at present, by party bias and political influence.

That after a time, all the Medical and Surgical Appointments at the Hospitals in the Three Capitals, (not exclusively supported by private charity,) shall be competitive:—The Examiners to be composed of the Government Professors, recommended by the representative Senate; and that these Examinations shall, like those for the Licentiateship, be conducted in public.

That the first and leading inquiry of the Examiners (as in France) shall be the antecedents of the Candidates: what are their published works (if any)? what practical and beneficial additions have they made to Medicine, Surgery, or the Collateral Sciences? Next, as shown by the public examination, what are their capabilities of reasoning and of imparting knowledge to others? The first to be decided by a thesis on some given subject; the second, by a clinical lecture upon a medical or surgical patient.

That as soon as the present arrangements can be sufficiently altered, no Examiner shall be a teacher for profit, as recommended by the late Sir A. Cooper; and that all the Fxaminers shall be the Professors, heretofore named, paid by the Government, and having no interest whatever in the examination fee.

CONCLUSION.

In this inquiry I have endeavoured, as briefly, and at the same time as comprehensively as possible, to make my readers acquainted with the past and present history of the profession:—to put them in possession of practical facts and deductions, about which there can be no question or cavil, as they are all from *Public* documents;—to show that there is nothing National about any of our Corporate institutions, as at present constituted;—that with few exceptions, as was well expressed by Mr. Carmichael, they have rather resembled private Clubs; and that, like the shoemaker in the fable, they recommend and advertise their own parchment.

In support of this evidence, I have given the opinions of men (and I could have multiplied this testimony to a great extent) that are, or have been in high position and high favour with their professional brethren; amongst these I may especially mention the donor of this prize.

I hope that I have not indulged in one unnecessary personality. As a faithful chronicler of events, I have been compelled to bring the public acts of men prominently before my readers, for the better elucidation of the subject, and to give force to my conclusions. I have only spoken of them in their Corporate capacities; and I am especially anxious that it should not be inferred from my remarks that *I* lay claim to any superior excellence or honesty; nor must it be supposed that, if I had been in the same position as many of the individuals whose public acts I condemn, that I might not have taken the same part that they have done. The greatest brawlers, both in Medical and general politics, have become silent as the grave when they have entered the dark and exclusive chambers which they had so long endeavoured to open to the "Commonalty."

To quote again Mr. Lawrence's remark in 1826, "Corporate bodies have always been found the most unsafe depositories of power."

Whatever the fate of this essay may be, I have the consolation of knowing that I have not modified or altered my opinions to please any body or class of men; that many of the suggestions here offered are in accordance with the views of the donor of this prize; and that they were publicly expressed, before Mr. Carmichael, in his memorable and graphic speech at the Medical Reform Congress in Dublin, in 1839, enunciated his opinions upon medical reform.

The plan I have suggested, which must be gradual in its accomplishment, would interfere with no corporation; no vested rights (so called); honorary and academical titles would be sought for with more avidity than at present; and the poor man, in his extremity, would be able to command efficient medical attendance;—Scientific Maps and boundaries would not be made to suit men's pockets;—a stimulus would be given to industry and talent;—the Three Heads, now snarling and sneering at each other, would gradually merge into *one*, with a smiling and honest face, the limbs having an interest in the body to which they are attached, would work for the general good; and some of the opulent Members of the various Corporations, like old Scrooge in Dickens's "Christmas Carol," might be rejoiced at the change, become so liberal in spirit that they would do what they have never perhaps thought of before—send for their attorneys, alter their wills, and leave money for the advancement of science and the good of humanity!

Dublin, with her vast resources for Medical and Surgical instruction, might become one of the first Schools in Europe; and the great number of Irish practitioners, who now go to Scotland for their diplomas would, as I have fully shown, be proud to call the National Faculty of Medicine of Ireland their *Alma Mater*. To conclude, in the words of Mr. Carmichael, "We should not then have Physicians and Surgeons traducing each other *en masse;* nor should we have the Dublin Apothecary, who aims at the rank and emolument of the general practitioner, playing off one against the other to his own advantage."

And now, my Lords, I bring this unfinished sketch to a conclusion. It has an important bearing upon Cholera, Cattle Plague, and upon every disease that afflicts man and brute. I have never written anonymously, and if any think that I have placed some of my own proceedings too much in the foreground, it has been done under the belief that I should benefit the cause I have so long advocated. To quote from the Hunterian Oration that I would have delivered before the Royal College of Surgeons (*London Medical Examiner*, March, 1851), "As there is a beautiful harmony in the structure of all human bodies, so all who treat their diseases should possess a uniformity of qualification, an accurate knowledge both of medicine and surgery, and the peasant should be provided with the same amount of medical skill as the lord:—

> "'Pallida mors æquo pulsat pede pauperum tabernas,
> Regumque turres.'"

I have the honour to be, my Lords,

Yours respectfully,

EDWARDS CRISP, M.D.

42, *Beaufort Street, Chelsea, & 21, Parliament Street,*
Sept. 13th, 1866.

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